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From the Editor

It is a huge honor and responsibility to be asked to serve as the editor of *Journal of Marketing* (*JM*). I am grateful for the confidence placed in me and intend to discharge the responsibility to the very best of my ability.

Before anything else, I would like to acknowledge the extraordinary job Roland Rust has done over the last three years as editor of *JM*. The discipline owes him a huge debt of gratitude. Thanks to his efforts and those of the prior editors, *JM* is in great shape and enjoys a preeminent position as judged by measures such as circulation, citations, impact factor, and (low levels of) self-citations.

I am also grateful to Roland for helping make the editorial transition as smooth as anyone can hope for. A big thank you, Roland!

Moving forward, Siva Balasubramanian has very kindly agreed to continue as the *JM* Web editor. He has done a terrific job over the past several years and continues to push ahead vigorously. Thank you, Siva! Sandeep Krishnamurthy has agreed to serve as the book review editor. He is well versed with the job and has many innovative ideas for the future. Welcome and thank you, Sandeep!

I would like to take this opportunity to address a few points that are likely to be on your minds as authors, reviewers, and readers.

What Kind of Articles Is *JM* Looking to Publish?

Journal of Marketing is well positioned as the preeminent journal for substantive insights into marketing issues. I intend to continue to stress this focus. I welcome manuscripts that provide fresh insights into any topic in marketing. Reasonable people may disagree on what should be included or excluded from the domain of marketing, but I tend to take a broader rather than a narrower view.

The journal is most interested in manuscripts that provide truly innovative insights that have the potential to significantly change the behavior of one or more of *JM*'s major stakeholders (e.g., thoughtful practitioners, marketing academics, public policy makers, consumers). It is important for an article to contain actionable implications. The broader the appeal of an article, the greater the impact it is likely to have. A useful yardstick of a manuscript's likely impact is, How much thinking and action on the part of how many people will likely change as a consequence of the research reported in the manuscript?

I intend to place a special premium on research that offers what I term "organic" or "indigenous" innovation. The marketing discipline shares conceptual and methodological ground with several other disciplines, such as economics, psychology, and sociology. To be sure, developments in other disciplines can help inform marketing issues. At the same time, I will strongly encourage organic (indigenous) innovation in marketing—that is, ideas, concepts, and theories that are new to the world, not just to marketing, and further our understanding of marketing issues.

There has been a sharp decline in conceptual articles in the discipline (MacInnis 2004). I view this as a matter of concern because a discipline's vibrancy and stature are reflected in part in the new conceptual ground it breaks. I welcome conceptual articles that explore unchartered territories and offer interesting and useful new insights.

What is accepted for publication is significantly influenced by the reviewers of the research. That said, as editor, I am willing to encourage a paper that I believe is particularly interesting and useful, even if some reviewers are not favorably disposed toward it.

The journal is least interested in manuscripts that take up a lot of space eventually to conclude the obvious. Although the question of whether a finding or conclusion is obvious ultimately is admittedly a judgment call, a useful indicator is, Do reasonably well-informed people already believe the finding and/or conclusion to be true, or would they believe so after brief reflection?

The journal is open to any method (e.g., experiment, survey, archival data analysis, historical method) that provides for reliable conclusions. I believe that each method has its own strengths and limitations, and the choice of the method should be guided by the research question addressed. The key criterion is whether the method used can lead to confidence in the study's findings or whether an alternative method is better for examining the focal research question.

It goes without saying that *JM* is interested in research that is rigorous. This is critical if there is to be confidence in the research conclusions. That said, I want to stress that in addition to being methodologically rigorous, the research must be conceptually rigorous as well. By conceptual rigor, I mean defining constructs clearly and precisely, using the same construct label (and definition) consistently throughout the paper, providing convincing and reasonable arguments in support of the research propositions, and stating them in a clear and testable way.

Finally, *JM* is not appropriate for manuscripts that are primarily focused on measurement or methodological issues. While such manuscripts are valuable in their own right, their fit is more appropriate for journals other than *JM*. As such, primarily methodological papers will be desk rejected.

Review Structure and Process

Journal of Marketing depends on its authors and reviewers. I am grateful to authors who submit interesting and useful manuscripts. I am also grateful to reviewers who provide timely, critical, and constructive reviews. It goes without saying that *JM* could not do without you, and I thank you very much for all your efforts!

I intend to retain the current review structure and process. With an increasing number of manuscript submissions, however, a time may come when *JM* may need to move to an associate editor structure. The Manuscript Cen-

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tral system has been designed with this in mind and will be able to accommodate the change readily.

Each manuscript is different. Depending on the manuscript, I will assign it to two to four reviewers. For the most part, I plan to make a positive or negative decision after the second round of reviews. I believe that it is not fair to authors or reviewers if a manuscript is dragged out any longer than this. This means that it is critical for an author invited to revise and resubmit a manuscript to do an extremely conscientious and thorough job of the revision.

The current editorial review board (ERB) members were invited on the basis of multiple criteria—their particular expertise, past service to the journal, research activity, and distribution across schools and geographies, among other criteria. I will add new members to the ERB depending on the needs of the journal. An important consideration in such appointments will be how well someone has served and continues to serve *JM*. On the flip side, if an ERB member is unable to fulfill his or her reviewing obligations, it would be entirely appropriate for him or her to step aside and make room for others.

If you are interested in serving as an ad hoc reviewer for *JM* but have not been invited to do so, please let me know. I will do my best to accommodate your interest. You may need to fill out a brief profile. (Please contact Chris Bartone at jom@ama.org for any assistance in this regard. He is a great resource, and the journal is indebted to him for all he does.)

A Few Suggestions for Authors

I hesitate even as I write this, but I want to make a few suggestions. I hope that these will be taken in the constructive spirit in which I provide them.

We have all probably received the advice to write clearly. Some of us are better at it than others. Good writing really makes a difference. It is not the job of an editor or the reviewers to decipher what an author means. It is the author's responsibility to communicate clearly and in an interesting way. Consider using the services of a copy editor. A colleague puts it like this: If an author does not want to sell his or her ideas, why should a reader want to buy? Sweat the small stuff. Make one sentence flow to the next. Brutally excise redundant words, sentences, and even paragraphs. Shorter sentences are much better than longer ones. Like this one! And yes, shorter manuscripts are just fine. The reviewers appreciate them as well!

Frequently, authors do not make their unique and novel contributions explicit. They are probably obvious to the authors, but they may not be as obvious to readers. This can be frustrating. I recommend coming right out and presenting your substantive contributions boldly and explicitly in the abstract and in the first two or three pages of your manuscript. Present them using substantive rather than "shell" statements. What do I mean by this? Shell statements are about substance, but not substance itself. For example, the shell statement "We identify managerial implications of our research" says nothing about the substance of the implications. It is not very satisfying. A more enlightening (substantive) statement would be "Our research suggests that marketing managers should pursue hybrid distribution in fragmented markets but not in concentrated ones."

Journal of Marketing is interested in providing substantive insights. Please emphasize substance throughout your manuscript—in the title, in the abstract, in the introduction, in the body, and in the conclusions.

A Few Suggestions for Reviewers

First, thank you for your hard work. I really appreciate it. Reviewing is an important responsibility. We benefit from it as authors, and as reviewers, we owe it to authors to provide them with timely, critical, and constructive comments.

Second, the journal's charter is to appeal to the academic and thoughtful practitioner communities. Therefore, it is critical to ask whether a manuscript addresses an interesting and useful research question. It does not matter how well the research is executed if the core issue is obvious, mundane, or not actionable. Please do not lose sight of this fundamental criterion in the thick of evaluating the research execution.

I find reviewer evaluations most helpful when structured as follows: two or three major strengths and two or three major weaknesses, followed by constructive suggestions and detailed comments for authors to improve the paper (regardless of the recommended disposition of the manuscript). A two- to three-page, single-spaced review is adequate in most cases, and of course, returning reviews on time is critical. As authors, we expect timely feedback; as reviewers, we owe the same to authors.

The Globalizing World of Academic Publishing

As should be evident to even a casual observer, *JM* has become more international over the years. It has more articles by non-U.S. authors, and it has more non-U.S. reviewers contributing to its mission. This is to be celebrated. It can only make the journal better. I will continue to encourage manuscript submissions from all parts of the world.

I hope that these remarks are helpful. I would welcome your suggestions for making *JM* stronger. Thank you. I look forward to working with you!

AJAY K. KOHLI
Editor

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Gerard J. Tellis, Jaideep C. Prabhu, & Rajesh K. Chandy

Radical Innovation Across Nations: The Preeminence of Corporate Culture

Radical innovation is an important driver of the growth, success, and wealth of firms and nations. Because of its importance, authors across various disciplines have proposed many theories about the drivers of such innovation, including government policy and labor, capital, and culture at the national level. The authors contrast these theories with one based on the corporate culture of the firm. They test their theory using survey and archival data from 759 firms across 17 major economies of the world. The results suggest the following: First, among the factors studied, corporate culture is the strongest driver of radical innovation across nations; culture consists of three attitudes and three practices. Second, the commercialization of radical innovations translates into a firm's financial performance; it is a stronger predictor of financial performance than other popular measures, such as patents. The authors discuss the implications of these findings for research and practice.

Keywords: innovation, corporate culture, cross-cultural, cross-national, marketing metrics

Radical innovation is crucial to the growth of firms and economies. It merges some markets, creates new ones, and destroys old ones. It can propel small outsiders into a position of industry leadership and can bring down large incumbents that fail to innovate (Chandy and Tellis 2000; Srinivasan, Lilien, and Rangaswamy 2002; Utterback 1994). Firms at the leading edge of radical innovation tend to dominate world markets and to promote the international competitiveness of their home economies (Atuahene-Gima 2005; Tellis and Golder 2001). Thus, radical innovation simultaneously drives market growth, firms' success, and nations' economic growth (Landes 1999; Sood and Tellis 2005; Sorescu, Chandy, and Prabhu 2003). For these reasons, managers and governments throughout the world are realizing the critical importance of radical innovation (e.g., Measuring Innovation in the 21st Century Economy Advisory Committee 2008; Yadav, Prabhu, and Chandy, 2007; Zhou, Yim, and Tse 2005).

Radical innovation varies substantially in firms across nations (Diamond 1999; Furman, Porter, and Stern 2002; Landes 1999). The primary question this article addresses is what explains these differences. A substantial body of literature on this topic already exists (e.g., Bartholomew 1997; Fagerberg, Mowery, and Nelson 2005; Im et al. 2003; Murtha, Lenway, and Hart 2001; Song and Parry 1997). However, researchers have pointed out at least four major limitations of this literature.

First, a growing body of cross-national literature on innovation has focused on consumer adoption of innovations and not on firms' commercialization of those innovations (e.g., Chandrasekaran and Tellis 2007, 2008; Tellis, Stremersch, and Yin 2003). However, the commercialization of innovations is a prerequisite for their adoption.

Second, the literature on firm innovation across nations has mainly focused on comparing the inputs of innovation, such as research-and-development (R&D) spending, scientific personnel, and patents (Archibugi and Coco 2005; Furman, Porter, and Stern 2002; Porter and Stern 1999). Few studies of innovation across nations have formally examined the outputs of innovation, such as commercialized innovations and the financial rewards to such innovations (see Godin 2002). However, inputs do not automatically lead to the creation of new products (Acs and Audretsch 1987; Griliches 1990) or guarantee the financial value firms and governments seek (Von Hippel 2005). The key challenge of converting inputs into commercially valuable outputs remains largely unaddressed (see Chandy et al. 2006; Hauser, Tellis, and Griffin 2007). Indeed, as Mairesse (qtd. in Kortum 2004, p. 358) noted in a recent roundtable of some of the leading thinkers on the topic, "We have exhausted all we can get from our old data sets on R&D, patents, citation counts."

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Third, current research on innovation in firms across nations has favored comparisons among firms in the developed economies of North America, Europe, and Japan (see Godin 2002, 2003; Therrien and Mohnen 2003) rather than with firms from emerging economies, such as those of East and South Asia. Yet firms and governments in emerging markets, such as Korea and Taiwan (Im et al. 2003), India (*The Economist* 2004), and China (Atuahene-Gima 2005; Song and Parry 1997), among others, increasingly understand that their long-term future lies in stimulating radical innovation. Given this reality, a broader sampling of nations would be fruitful.

Fourth, prior research has studied the importance of either national drivers (e.g., Archibugi and Coco 2005) or firm drivers (e.g., Damanpour 1991; Sethi and Iqbal 2008) of innovation but has not formally compared the effects of these drivers in the same study (see Kortum 2004). In the absence of such integrated research, policy could be directed at some drivers (e.g., regulation, intellectual property protection) that may well be less powerful than others (e.g., management practice within firms) in spurring innovation (Branstetter and Nakamura 2003; Kortum 2004).

This study is an initial attempt to address these gaps in existing research. We identify 42 drivers of radical innovation, including 31 country drivers and 11 firm drivers. We test our models using data from a survey of more than 750 public firms of various sizes and sectors across 17 nations (see Table 1). In doing so, we make four contributions to the study of innovation in firms across nations.

First, we examine a critical output of innovation—the commercialization of radically new products—rather than the inputs of innovation, as many existing studies of cross-national innovation tend to do. Moreover, we contribute to recent research in marketing on conversion ability by examining which inputs actually yield outputs in the form of innovative products and financial returns (Chandy et al. 2006).

TABLE 1
Sample and Responses Rate by Nation

Nation	Sample	Responses	Response Rate (%)
Total	4074	772	18.9
Australia	128	35	27.3
Canada	154	25	16.2
China	183	31	16.9
France	242	39	16.1
Germany	315	81	25.7
Hong Kong	167	15	9.0
India	139	28	20.1
Italy	99	32	32.3
Japan	409	57	13.9
Korea	333	87	26.1
The Netherlands	62	17	27.4
Singapore	176	24	13.6
Sweden	113	26	23.0
Switzerland	80	23	28.8
Taiwan	243	83	34.2
United Kingdom	383	67	17.5
United States	848	102	12.0

Second, we study radical innovation in a fairly large number of nations, including both developed and emerging economies. In contrast, existing research tends to focus on relatively limited sets of nations (see De Luca and Atuahene-Gima 2007; Im et al. 2003; Song and Parry 1997; Zhou, Yim, and Tse 2005).

Third, we combine insights and data at the macro (national) level with insights and data at the micro (firm) level to examine the relative importance of firm versus national factors in driving innovation in firms across nations. Researchers in marketing have typically focused on the firm level, whereas researchers in fields such as public policy have examined the national level.

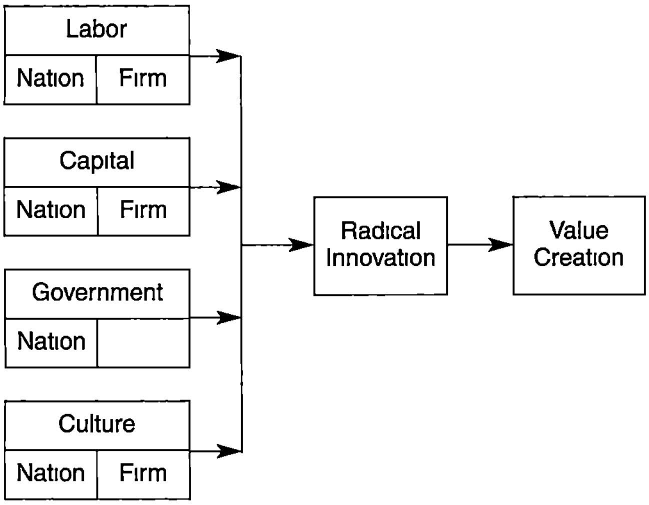
Fourth, and perhaps most important, we integrate prior research in marketing and management with recent research on trends in the global economy to propose and test a theory of radical innovation based on the corporate culture of the firm. This theory posits that in today's converging economies, among the many drivers of radical innovation, those based on corporate culture are likely to be primary drivers of such innovation in firms across nations (e.g., Chandy and Tellis 1998; Govindarajan and Kopalle 2004).

Theory

The disciplinary wellsprings of research on innovation are many (Fagerberg, Mowery, and Nelson 2005). Scholars in history, economics, law, engineering, sociology, management, marketing, international business, and public policy have all contributed to the understanding of the drivers of innovation across nations (e.g., Bartholomew 1997; Fagerberg, Mowery, and Nelson 2005; Im et al. 2003; Murtha, Lenway, and Hart 2001; Song and Parry 1997). Given how many ideas populate the subject of innovation and how dispersed they are, unifying these ideas is a challenging task (see Kortum 2004; Nelson 1993). Within any disciplinary area, researchers tend to examine the drivers of innovation that are most salient to their own discipline. Few existing theories or frameworks integrate both firm and national drivers of innovation across nations. Cross-disciplinary frameworks that exist tend to be tailored to fit the unique circumstances of individual industries (e.g., Bartholomew 1997) or individual nations (e.g., Mowery and Rosenberg 1993) and are not easily applied beyond their original contexts (see Furman, Porter, and Stern 2002; Nelson 1993).

The current status of the literature is both a challenge and an opportunity for marketers interested in the drivers of radical product innovation. Now is an opportune time to integrate the far-flung ideas that are relevant to this topic. Indeed, a "home-grown" theory of the type advocated by Rust (2006, p. 1) has the potential to guide thinking and practice not just in the field of marketing but in associated fields as well. As a first step toward building such theory, we propose a framework that links key drivers of innovation with key innovation outcomes (see Figure 1). The next section uses this framework to build a metatheory of the drivers and fruits of radical innovation in firms across nations. We first outline some of the potential drivers proposed in the literature on innovation in firms across nations.

FIGURE 1
Framework of the Drivers of Radical Innovation and Value Creation



Next, we introduce our culture-centric theory of radical innovation.

Drivers of Radical Innovation in Firms Across Nations

A review of the literature on innovation across nations suggests that four factors underlie most explanations for why certain firms in certain nations are more innovative than others: skilled labor, capital, government, and culture (Bartholomew 1997, Demirguç-Kunt and Levine 2001, Furman, Porter, and Stern 2002, Nelson 1993). The terms to describe these factors and the variables studied within them may differ by discipline (Kortum 2004). Moreover, the boundaries between these factors can be fuzzy. Nevertheless, we believe that these factors incorporate most variables that are currently viewed as driving radical product innovation in firms across nations in a reasonably coherent way. Of these factors, all except government operate at two levels: (1) the national level, in the context of the entire economy, and (2) the firm level, in the context of the individual firm. In the subsequent paragraphs, we briefly describe the role of each factor in driving radical innovation. For the sake of brevity, and consistent with objectives of this research, we focus on the main effects of these factors in our discussion.[1]

Labor. We use the term labor to refer to the skilled workforce accessible to a particular firm in a particular country. A long tradition of research has pointed to the importance of a skilled workforce as a primary driver of innovation, both at the national and at the firm level (e.g., Committee on Science, Engineering, and Public Policy 2005, Daniels 1993, Furman, Porter, and Stern 2002, Mowery and Rosenberg 1993). In general, an educated and skilled workforce, especially in scientific and technical fields, is viewed as a prerequisite for the development and commercialization of novel products. For example, at the national level, Freeman (1992, p. 171) traces the emergence of the United States and Germany as technological powers in the nineteenth and twentieth centuries and the loss of British technological leadership during this time to these factors: "It was above all the increasing availability of considerable numbers of professional engineers and other skilled people which gave the decisive advantage to German and American industry."

As with the national level, a skilled workforce is also important at the firm level. Of special importance to firms is the availability of skilled scientific and technical talent within the firm (Zucker, Darby, and Armstrong 2002). Despite national differences, differences among firms' ability to recruit and retain talented technical personnel are likely to explain differences in their innovation output and the value they capture from this output (Sorescu, Chandy, and Prabhu 2007).

Capital. Capital refers to the financial resources that are available in the country as a whole as well as within firms that operate in the country. Countries with strong and vibrant financial systems are likely to provide greater access to the financial resources needed for innovation (see Edquist 2005, Huang and Xu 1999) than countries that are not so well equipped. Sources of financial inputs include banks, stock markets, and venture capital. While stock markets provide access to equity for established firms, banks serve as a source of finance for private firms and small firms from established sectors (Levine and Zervos 1998). A fair number of countries now have an active network of venture capitalists that support new innovative enterprises. Risky and emerging firms and sectors are likely to benefit from such networks in their drive toward innovation (Kortum and Lerner 2000).

At the firm level, the financial resources available within individual firms are likely to play an important role in driving innovation. Within any specific country, firms that have greater access to financial resources are, ceteris paribus, likely to be more innovative and to create greater value from their innovations (Sorescu, Chandy, and Prabhu 2003).

However, the mere availability of capital, whether at the national or the firm level, will translate into innovation only if the capital is used to make the right kinds of investments. At the national level, greater investment in R&D is likely to yield greater access to new product ideas for firms in the economy, the spillover of knowledge created by such spending is likely to benefit firms operating throughout the economy (Jaffe, Trajtenberg, and Fogarty 2000). Similarly, within firms, those that spend more on R&D are likely to be more innovative and, ceteris paribus, to capture more value from innovation than firms that spend less on R&D (see Dutta, Narasimhan, and Rajiv 1999).

Government. Prior literature has suggested that several aspects of government policy can help or hurt innovation within firms that operate in a country (Edquist 2005, Nelson

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[1] The literature also indicates that these factors may intersect and interact dynamically with each other (see Bartholomew 1997, Murtha, Lenway, and Hart 2001, Nelson 1993). We test for these intersections and interactions subsequently.

1993) As Nelson (1993, p 512) notes, “Much of the current interest in national systems of innovation reflects a belief that the innovative prowess of national firms is determined to a considerable extent by government policies” Among the most important aspects of policy are the protection the government provides for intellectual property, its involvement in technology development through its encouragement of collaboration between universities and industry, and its involvement in the diffusion of innovation through its procurement of innovative outputs in sectors such as defense, health, and education

The case for intellectual property protection in driving innovation is made strongly by legal scholars and some economists (Gutterman and Anderson 1997, Webster and Packer 1996) The argument is that protection for the ideas behind innovations enables innovators to reap the rewards for developing innovations and undertaking risks in commercializing them Some proponents suggest that the success of Europe relative to Asia in the post-Renaissance period resulted from the former’s legal support of intellectual property rights (e g , Landes 1999, North and Thomas 1973) Others offer the innovativeness of the United States over Europe in the past 100 years as being due to its strong patent, trademark, and copyright laws (e g , Rosenberg and Birdzell 1986)

Many scholars argue that government legislation, such as the U S Bayh–Dole Act (35 U S C § 200–212), which encourages and facilitates collaboration between universities and industry, is a likely driver of innovation within firms in the country (Etzkowitz and Leydesdorff 2000, Mowery and Sampat 2004) Such policy may help transform the basic research that occurs at universities into applications that firms can commercialize In addition, it may yield graduates whose skills are closely attuned to the innovation tasks that firms face By creating laws that enable universities to engage in such collaboration with firms and by providing incentives that encourage them to do so, governments can help stimulate the innovativeness of firms that operate in their countries

Governments can also support innovation in firms either indirectly through R&D tax credits or directly through the procurement of new technology (Bartholomew 1997, Hall 1993, Hall and Van Reenen 2000) Such support can potentially create markets for products and technologies that otherwise may take many years to materialize or never materialize at all In recent years, R&D programs targeted at security, military, and public health needs have been a primary arena for government procurement and tax credits (Nelson 1993) For example, now-ubiquitous technologies in semiconductors, telecommunications, energy, and computing owe their origins in part to government-sponsored research with military aims Nevertheless, the actual impact of government procurement and R&D tax policies remains ambiguous, some scholars note that though such policies might have raised technical development or scientists’ wages in certain fields, innovation outputs have been nonexistent or slow to follow (Goolsbee 1998, Mansfield 1984)

Culture Culture refers to a core set of attitudes and practices that are shared by the members of a collective entity, such as a nation or a firm (Hofstede 2003, Smircich 1983) The definitions of culture are many, and “culture, like love, is a many-splendored thing” (Prabhu, Chandy, and Ellis 2005, p 120) However, as Triandis (1996, p 407) states, “almost all researchers agree that culture is reflected in shared cognitions [and] standard operating procedures” Our definition of culture in terms of attitudes and practices is consistent with and analogous to definitions that view culture in other terms, such as values, rituals, and codes (see Denison 1996, Deshpandé and Webster 1989, Gregory 1983, Jones, Jimmieson, and Griffiths 2005, Miles and Snow 1978, Rokeach 1973, Triandis 1994) As with labor and capital, culture can operate at both the national and the firm level

An extensive body of literature suggests three related aspects of national culture that may drive innovation a nation’s religion, its geographic location, and the values of its citizens (Hofstede 2003) Some analysts argue that religious beliefs can influence the development and adoption of innovations (see Gorski 2003) because some faiths provide believers with a strong rationale to work in and transform their environment, while others tend to emphasize the renunciation of worldly pleasures for rewards in the afterlife (DeLong 1988, Landes 1999, Weber 1930) [2] Similarly, some researchers argue that a nation’s geographical location—specifically, its distance from the equator—could reflect attitudes and practices that help or hinder innovation (e g , Landes 1999, Parker 2000) Because warm climates are more abundant in animal and vegetable life than cold ones, they could lead to easier lifestyles and fewer incentives for work and innovation, while cold climates, which are more hostile, require long-term planning and motivate people to action, work, and innovation (Landes 1999) Finally, Hofstede (2003) shows that nations may differ along specific cultural dimensions, such as individualism–collectivism, uncertainty avoidance, power distance, masculinity–femininity, and long-term orientation Recently, other researchers have updated and refined these dimensions (House et al 2004) and have highlighted their likely impact on innovation (see Dwyer, Mesak, and Hsu 2005, Shane 1994)

As with national culture, recent research indicates that corporate culture may play a role in radical innovation Corporate culture refers to a core set of attitudes and practices that are shared by the members of the firm (Denison 1996, Deshpandé and Webster 1989, Detert, Schroeder, and Mauriel 2000, Hatch 1993, Martin 2002, Schein 1999, Schultz and Hatch 1996) A culture that fosters relentless innovation may help ensure that the firm stays constantly at the leading edge of innovation (Govindarajan and Kopalle 2004, Tellis and Golder 2001)

In the next subsection, we highlight the importance of corporate culture in driving innovation and propose a culture-centric theory of radical innovation in firms We use the terms "firm culture" and "corporate culture" interchangeably

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[2] However, as an anonymous reviewer noted, the distribution of religious beliefs among decision makers in a given firm may not reflect the distribution of religious beliefs in the country as a whole

A Culture-Centric Theory of Radical Innovation

Although researchers have proposed labor, capital, government, and culture as drivers of innovation, few have formally examined the relative importance of these factors in contemporary firms In the next stage of theory development, we propose that in today's capitalist economies, labor, capital, and government may not be the primary factors that distinguish innovative firms from others Nor may national culture in itself be the major factor of importance Rather, we argue that corporate culture is likely to be an important driver of innovation in firms across nations, for three reasons

Importance of corporate culture First, markets for labor and capital have been evolving in capitalist economies over the past 400 years (Mannie, Zhang, and Hu 2006, Wright, Pruthi, and Lockett 2005) In many capitalist countries, especially with the onset of information technology, these markets are now reasonably efficient and increasingly mature and interconnected Thus, innovative firms now have the ability to tap these markets for labor and capital to bring their innovations to fruition In particular, the presence of markets for venture capital enables entrepreneurs and entrepreneurial firms to gain access to capital for radical innovations, though at a steeper rate than in the stock market (Gompers and Lerner 2001)[3]

Second, recent years have witnessed an increased convergence across developed and emerging nations in the extent to which labor and capital are accessible to firms (Demirguç-Kunt and Levine 2001, Krugman, Cooper, and Srinivasan 1995) and the extent to which government policies are synchronized across nations (Gong and Keller 2003, Hussler 2004, Lemola 2002) Although far from easy, negotiations across governments have led to some agreements on market and capital access across borders Moreover, our discussions with policy makers in both developed and emerging nations suggest another factor that could be even more important than formal agreements in promoting policy convergence Policy makers in many nations have learned to keep a close eye on regulatory and technological developments elsewhere and have unilaterally integrated their own nations into international markets (see Baldwin 2006, Krugman, Cooper, and Srinivasan 1995, Naim 2007) In addition, though far from frictionless, markets of a reasonably efficient kind exist for both labor and capital in many leading and emerging nations Capital markets have flourished in economies in many parts of the world (Kumar and Russell 2002) Novel and promising ideas, whether in emerging economies, such as India and China, or in established markets of the Organisation for Economic Cooperation and Development (OECD), now attract capital in a manner that is in many ways unprecedented in history Similarly, both developing and developed nations understand the importance of educational and other labor-related investments Even in cases such as India and China, where the proportion of qualified technical personnel is not currently large relative to the population of these nations, the sheer number of available personnel makes it possible for firms to meet their current innovation needs Increasingly, therefore, access to labor is also diminishing in its importance as a factor that explains differentials in innovation in firms across nations Moreover, multilateral trade agreements and pannational institutions, such as the World Trade Organization, have helped promote an increased convergence in government policies across nations on intellectual property protection, government procurement, and collaboration between universities and industry (Baldwin 2006)

Third, culture is a uniquely human product that develops slowly within firms, is tacit and not easily defined, and is not easily transported across firms (Jassawalla and Sashittal 2002, Schein 1999) Indeed, markets for culture are either nonexistent or not very efficient Reporting requirements and the presence of firms (e g , Dun & Bradstreet) that specialize in corporate information help ensure that the size and type of labor and capital pool employed by a particular firm is often evident to (and thus open to imitation by) its competitors However, corporate culture is a much more elusive factor than labor, capital, and government regulation

Thus, we posit that capital, labor, and government regulation may be important drivers of radical innovation in firms across nations However, in today's converging economies, corporate culture may also be more important than labor, capital, government, and national culture in explaining innovation in firms across nations

Components of corporate culture Following prior research, we examine corporate culture by studying the core set of attitudes and practices shared by members of the firm (Deshpandé and Webster 1989, Henard and Szymanski 2001, Smircich 1983) We do so with the recognition that the attitudes and practices that are most relevant to the innovation task are unlikely to be identical to those for other tasks For this reason, scholars of corporate culture have called for middle-range descriptions of corporate culture—descriptions that preserve the holistic aspects of the construct while acknowledging the particulars of the tasks or outcomes being studied (see Bourgeois 1979) For example, Homburg and Pflesser (2000) examine market-oriented culture by studying the attitudes and practices that the literature suggests are most relevant to market orientation Hofstede and colleagues (1999) examine the role of corporate culture in employee promotion and dismissal outcomes by studying attitudes and practices that the literature suggests are most relevant to those outcomes In the same vein, we examine the role of corporate culture on radical innovation by studying attitudes and practices that the literature suggests are most relevant to this outcome

On the basis of prior research, we identify three firm attitudes and three firm practices that may drive innovation (see Chandy and Tellis 1998, Olson, Walker, and Ruekert

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[3] That said, we acknowledge that the sources of available capital may vary among nations as a result of historic and systemic reasons For example, although German and Japanese firms rely more on debt and bank sources, U S firms rely more on stock and nonbank sources (see Demirguç-Kunt and Levine 2001) Furthermore, stock markets in some nations, such as China, are more nascent than stock markets in North America or Western Europe

1995) The attitudes are the willingness to cannibalize assets, future orientation, and tolerance for risk These attitudes are likely to be essential drivers of innovation for the following reasons First, a great hindrance to enduring innovation is the stream of profits that emerge from current products and services The firm invariably tends to marshal great resources to protect this stream of profits Any change or innovation that might threaten it is vetoed or frozen A willingness to cannibalize assets is an attitude that puts up for review and sacrifice current profit-generating assets, including current profitable and successful innovations, so that the firm can get ahead with the next generation of innovations (Chandy and Tellis 1998) Second, a firm that is successful in one generation of technology is under pressure to focus on the many micro problems it faces in managing its success with that generation A future orientation forces a firm to realize the limitations of the current technology and the emergence of a new generation of technology that may become dominant in the future (Christensen and Bower 1996, Narver and Slater 1998, Yadav, Prabhu, and Chandy 2007) Third, trading a current, sure stream of profits for a future, uncertain stream of profits is risky and does not come naturally to managers It is vital that a firm foster and promote a tolerance for risk to make that essential trade-off (Fiegenbaum and Thomas 1988, Gilman 1995, Kuczmarski 1996) Thus, willingness to cannibalize assets, future orientation, and tolerance for risk are three essential attitudes that constitute an innovative culture

Prior research has also led us to identify three practices that engender and sustain these attitudes First among these is the empowerment of product champions By this practice, a firm empowers an individual with resources to explore, research, and build on promising, but uncertain, future technologies (Howell and Higgins 1990, Markham and Griffin 1998, Shane 1994) In effect, empowerment embeds within the firm the enterprising spirit that enabled it to initiate the original innovation that brought it success Second, the firm needs to establish incentives for enterprise (Makri, Lane, and Gomez-Mejia 2006, Zenger and Lazzarini 2004) By this practice, the firm refrains from rewarding only or primarily seniority or management of current products Rather, it ensures that adequate, if not large, incentives are reserved for employees who venture to explore or build new enterprises for the firm A third practice is the creation and maintenance of internal markets (Halal, Geranmayeh, and Pourdehnad 1993) This practice involves two elements internal autonomy and internal competition (Chandy and Tellis 1998) Internal autonomy refers to the extent to which division managers enjoy decision-making authority in the firm relative to the corporate office (Aiken and Hage 1968, Olson, Walker, and Ruekert 1995) Internal competition requires that divisions or groups of employees within the firm compete among themselves to identify promising technologies and build innovations on those technologies A firm with an active internal market creates the marketplace within itself, ensuring that an innovator from outside will not upstage the firm

In summary, although many variables at the national and firm level can drive radical innovation in firms across nations, our culture-centric theory of radical innovation posits that in today's converging economies, corporate culture may be the most important driver among all these variables Next, we describe the model we use to test our arguments

Model

Our empirical model has two equations Equation 1 tests the effects of various drivers of innovation on radical innovation in firms across nations, as our previously articulated arguments suggest Equation 2 tests the effects of radical innovation (relative to traditional metrics, such as patents and R&D) on a firm's financial performance For both equations, we have repeated measures across many industries, we account for industry heterogeneity using an industry fixed-effects model

On the basis of our theory, we specify Equation 1 as follows

$$\begin{aligned}(1)\quad \text{Radical Innovation}_{fci} = {} & \delta_0 + \delta_j\text{Labor}_c + \delta_j\text{Labor}_f \\ & + \delta_j\text{Capital}_c + \delta_j\text{Capital}_f \\ & + \delta_j\text{Government}_c + \Sigma_k\delta_{jk}\text{Culture}_{ck} \\ & + \Sigma_l\delta_{jl}\text{Culture}_{fl} + \Sigma_m\delta_{jm}\text{Controls}_{fcim} \\ & + v_i + \varepsilon_{fci},\end{aligned}$$

where f, i, and c are firm, industry, and country indexes, respectively, δ_js are parameters to be estimated for the jth variable, the subscripts k, l, and m are indexes for variables in national culture, firm culture, and control variables, respectively, Radical Innovation is a measure that captures the radical innovation of a firm f, Labor is a set of variables that measure skilled labor-related drivers of innovation at the national or firm level, Capital is a set of variables that measure capital-related drivers of innovation at the national or firm level, Government is a set of variables that measure government policy–related drivers of innovation, Culture is a set of variables that captures national and firm culture, v_i are industry-specific error terms, and ε_{fci} is the remaining error term (initially assumed to independently and identically follow a normal distribution) Finally, Controls is a set of variables that are also likely to influence firms' radical innovation, these include firms' citation-weighted patents and the nation's population and gross domestic product (GDP)[4]

Equation 2 assesses the effect of radical innovation on financial performance

$$\begin{aligned}(2)\quad \text{Value}_{fci} = {} & \beta_0 + \beta_j\text{Radical Innovation}_{fci} + \beta_j\text{Patents}_f \\ & + \beta_j\text{R\&D}_f + \Sigma_l\beta_{jl}\text{Controls}_{fcil} + v'_i + \varepsilon'_{fci},\end{aligned}$$

where f, i, and c are firm, industry, and country indexes, respectively, β_js are parameters to be estimated for the jth variable, Value is the market-to-book ratio of firm f, Radical Innovation is a measure that captures the radical innovation of firm f, Patents is the citation-weighted patents owned by firm f, R&D is the percentage of sales spent on R&D by firm f, v'_i are industry-specific error terms, and ε'_{fci} is the remaining error term (initially assumed to independently and identically follow a normal distribution) Controls is a set of variables that are also likely to influence firms' financial performance, these include firm size and country GDP, population, inflation, and credit rating We do not include national culture in Equation 2, because there is little literature to support the effects of these variables on firms' financial performance However, including these variables in the estimation does not substantially change the results of the financial impact of radical innovation

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[4] Other firm factors, such as leadership quality and cross-functional integration, may also drive innovation Because of resource constraints, we do not cover these factors in this research

We estimate both Equations 1 and 2 using industry-level fixed-effects regression models Furthermore, we estimate Equations 1 and 2 separately because (1) the two equations form a recursive system—Radical Innovation influences Value, but Value (which is forward looking and measured later in time than Radical Innovation) does not influence Radical Innovation, (2) an analysis of the correlation between the error terms of each of the equations indicates that these errors are uncorrelated, and (3) recursive systems with uncorrelated errors do not require joint estimation of their constituent equations (for a formal proof, see Land 1973)

Method

Sampling

Resources at our disposal limit our study to 17 nations To ensure that we capture a large fraction of the world economy, we chose the 8 largest economies on the basis of purchasing power parity the United States, China, Japan, India, Germany, the United Kingdom, France, and Italy To capture the possible role of innovation in propelling nations' recent progress, we chose 4 nations that have developed rapidly Taiwan, Hong Kong, Korea, and Singapore We also chose 5 nations with known major innovative or multinational firms Canada, Switzerland, Netherlands, Sweden, and Australia

We selected a sample of publicly listed firms only, which enables us to integrate our survey data with data from archival sources on these firms We also chose only firms within the manufacturing sector that are primarily local to their country of origin In other words, we excluded local subsidiaries of multinational firms because they confound the role of parent firm and local national culture (see Bartlett and Ghoshal 1995, Prahalad and Doz 1987) We sampled between 62 and 848 firms from each nation to reflect the size of these nations' economy and the extent of public listings within them (for sample sizes by nation, see Table 1) We used stratified sampling by firm size, 15% of our sample consists of the largest firms in the country, and the remaining 85% consists of a third each of large, medium, and small firms

Procedure

Survey data We used the following procedure to develop our questionnaires and conduct the survey First, we developed a preliminary questionnaire based on discussions with managers and using scales and items from prior academic research as well as innovation surveys conducted by the OECD and the European Union (EU), for the latter, we drew on both the OECD's (2005) Oslo Manual and the EU's Community Innovation Survey (Eurostat 1997, 2000) Second, in the questionnaire, we were careful to provide respondents with clear definitions of our key terms, such as firm, industry, and radical product innovation We also provided examples of each of these types of innovations We used multiple items for each construct and negatively and positively valenced items to minimize demand bias and yea-saying (Baumgartner and Steenkamp 2001, 2006) Third, we pretested this questionnaire by sending it to a subsample of 100 firms from four English-speaking nations in our sample (the United States, Canada, the United Kingdom, and Australia) Fourth, after checking for the validity and reliability of the scales, we translated the original English language questionnaire into the other seven languages in our sample (French, German, Italian, Japanese, Korean, Mandarin Chinese, and simplified Chinese) We used independent experts to back translate and retranslate these questionnaires to ensure accuracy and consistency In some cases, we cross-checked the translated surveys face-to-face with managers from the nation in question (Germany, Switzerland, Japan, and Korea)

Fifth, we obtained the names of firms to make up our sample from the OSIRIS and Worldscope databases, telephoned these firms to identify the vice president for innovation or technology or the equivalent at each firm, and mailed the surveys to all firms in all countries over a six-month period We sent a reminder letter to each firm 10 to 14 days after we mailed the survey Sixth, we performed relevant validity, reliability, and cross-cultural equivalence checks (see item 6 in Appendix A) on the survey data to develop the metrics we used in our analysis Finally, we controlled for yea- and nay-saying, midpoint bias, and extreme response bias across firms and nations by applying the correction procedure used by Triandis (1994) and House and colleagues (2004) By subtracting the mean and dividing by the standard deviation across all responses per firm, this method corrects for the four types of previously mentioned biases All survey-based items used in subsequent analyses are corrected for these biases

Archival data In addition to survey data on firm innovation inputs, outputs, and drivers of innovation, we collected data from multiple archival sources (see Table 2) We collected two types of firm secondary data patent data from Delphion and firm financials from OSIRIS and Worldscope We also collected several types of national secondary data First, we collected ratio scale data from the OECD and perceptual data from the World Economic Forum and the IMD World Competitiveness Report on various measures of national labor, capital, and government policy Second, we collected data on religion from the CIA World Factbook and data on geographical location from Parker (2000) and worldatlas com Finally, we collected data on national culture from Hofstede (2003) and the GLOBE leadership survey (House et al 2004) We linked the survey and archival

TABLE 2
Sources and Measures of Constructs

Conceptual Variable	Measure	Data Source
Radical innovation	•Three-item additive scale with GLOBE correction	•Global Innovation Survey
Firm financial performance	•Market-to-book ratio	•Worldscope, OSIRIS
Labor	**National Level:**	
	•Availability of scientists and engineers	•World Economic Forum
	•Quality of scientific research institutions	•World Competitiveness Report
	•Quality of management schools	
	•Total public expenditure on education as a percentage of GDP	•IMD World Competitiveness Report
	•R&D personnel nationwide per capita	•OECD Science and Technology Indicators
	Firm Level.	
	•R&D employees as a percentage of total employees	•Global Innovation Survey
Capital	**National Level:**	
	•Financial market sophistication	•World Economic Forum
	•Soundness of banks	•World Competitiveness Report
	•Ease of access to loans	
	•Venture capital availability	
	•R&D expenditure per capita	•OECD Science and Technology Indicators
	Firm Level:	
	•Sales revenue	•Global Innovation Survey
	•R&D spending as a percentage of sales	
Government	•Intellectual property protection	•World Economic Forum
	•University/industry research collaboration	•World Competitiveness Report
	•Government subsidies and tax credits for firm R&D	
	•Government procurement of advanced technology products	
Culture	**National Level:**	
	•Religion: % of population belonging to major world religions: Catholic, Protestant, Buddhist, Muslim, Hindu-Sikh, nonaffiliated, and other	•CIA World Factbook
	•Geographic location: latitude (degrees) of country's capital city	•Parker (2000) and worldatlas.com
	•Values: Hofstede's measures of power distance, uncertainty avoidance, individualism, masculinity, and long-term orientation	•Hofstede Web site
	Firm Level:	
	•Willingness to cannibalize	•Global Innovation Survey
	•Future market orientation	
	•Risk tolerance	
	•Product champions	
	•Incentives	
	•Internal markets	
Control variables	**National Level:**	
	•GDP	•World Economic Forum
	•Population	•World Competitiveness Report
	•Inflation	
	•National credit rating	
	Firm Level:	
	•Citation-weighted patents	•Delphion
	•Primary industry	•OSIRIS, Worldscope

data at the firm and national level to assemble a pooled database that we use in all subsequent analyses (for response rates to the survey, see Table 1)

Measures

Dependent Variables

Radical innovation We used a three-item scale to measure radical innovation (Chandy and Tellis 1998, Nijssen, Hillebrand, and Vermeulen 2005) These items are all seven-point Likert items measuring the extent of radical innovation within the firm We combined these items into a three-item additive scale We found this scale to be fairly reliable (Cronbach's $\alpha = 62$) We also found it to have validity It correlates well ($\rho = 38, p < 0001$) with a fourth seven-point item that measures the percentage of sales based on radical innovations by the firm in the previous three years (for details, see Appendix B)[5]

Financial performance We measured financial performance using individual firms' market-to-book ratio (Barber and Lyon 1997, Fama and French 1992, 1995)—that is, the ratio of a firm's stock market value to the book values of its assets We used this measure for three reasons First, market-to-book values represent investors' valuation of a firm based on all its activities and potential Second, this measure is future oriented because stock prices represent the net present value of expected current and future cash flows Third, the ratio provides a measure of the intangible value of the firm beyond its assets, due to factors such as innovation We collected financial data for each firm at the end of 2003 from Worldscope and OSIRIS

Independent Variables

Corporate culture We collected data through the questionnaire on several organizational drivers of innovation willingness to cannibalize, future focus, risk tolerance, use of incentives, product champions, and internal markets Willingness to cannibalize refers to the extent to which a firm is prepared to reduce the value of its own prior investments Future market orientation is the extent to which a firm emphasizes, in its market research activities, customers and competitors that are not currently in the markets it serves Tolerance for risk refers to the extent to which a firm takes on risk to fulfill a desired goal The key practices we examine are incentives, empowerment of product champions, and internal markets (see Howell and Higgins 1990, Quinn and Rivoli 1991) Incentives refer to the monetary and nonmonetary rewards a firm has in place to reward innovation Empowerment of product champions refers to the extent to which a firm promotes the activities of people who aggressively pursue new product ideas Finally, internal markets refer to the level of internal autonomy and internal competition that exists among business units in a firm

We developed items for these measures (for details, see Appendix B) from existing research (e g , Chandy and Tellis 1998, Mols 2001) We combined these items to develop additive scales for each of the variables of interest, after controlling for response biases as discussed previously

National culture We used two sources of data on national culture Consistent with prior research, we used Hofstede's (2003) measures of national culture on the following dimensions power distance, uncertainty avoidance, individualism, masculinity, and long-term orientation (see also Mitra and Golder 2002) We also collected data from the GLOBE Study of Culture, Leadership, and Organizations (House et al 2004) on the following dimensions performance orientation, future orientation, gender egalitarianism, assertiveness, individualism and collectivism, power distance, humane orientation, and uncertainty avoidance The results we report in this article use Hofstede's measures However, our results are also robust to the use of the GLOBE measures We measured national religion by collecting data on the percentage of people within a nation who belong to the following religious groups Protestant, Catholic, Jewish, Hindu, Buddhist, and Muslim We obtained this information from the CIA World Factbook We measured geographical location using the latitude of the capital city of the country[6] We obtained this data from Parker (2000) and worldatlas com

National labor, capital, and government policy We collected and coded archival data on labor, capital, and government policy for each nation in our sample To measure labor, we collected data on five variables the availability of scientists and engineers, the quality of scientific research institutions, the quality of management schools (all from the World Economic Forum's World Competitiveness Report), R&D personnel per 1000 people nationwide, and the total public expenditure on education as a percentage of GDP (from the IMD World Competitiveness Report) All five variables load on one factor, and we used the factor score as a summary measure of national labor

To measure capital, we collected data on five variables financial market sophistication, soundness of banks, ease of access to loans, venture capital availability (all from the World Economic Forum's World Competitiveness Report), and the nation's per capita R&D spending (from the IMD World Competitiveness Report) Again, all five variables load on one factor, and we used the factor score as a summary measure of national capital

Finally, to measure government policy, we collected data on intellectual property protection, university/industry research collaboration, government subsidies and tax credits for firm R&D, and government procurement of advanced technology products (all from the World Economic Forum's World Competitiveness Report) Again, all four variables load on one factor, and we used the factor score as a summary measure of national capital

Firm labor and capital We also collected and coded data on skilled labor and capital for each firm in our sample

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[5] We also created an alternative scale that uses all four items, our results are robust to the use of this four-item additive scale instead of the three-item scale we used for the results reported herein

[6] We also used an alternative measure based on the squared latitude of the capital city The results are robust to this measure

We measured skilled labor using the percentage of the total number of employees who were employed in R&D in the year before our survey We measured capital using the firm's R&D spending as a percentage of sales in the year before our survey

Control Variables

The control variables in Equation 1 include the national GDP and population and the firm's citation-weighted U S patent outputs and its size in sales revenue Patents represent codified know-how that, as intermediate outputs of the innovation process, may in turn be embodied in final outputs, such as radical innovations Some researchers and policy makers consider the registration of patents so important that they equate patents to innovation and sometimes measure the latter with the former (Archibugi and Coco 2005, Furman, Porter, and Stern 2002, Porter and Stern 1999) This line of thinking suggests that patents would be an important driver of radical innovation Furthermore, if markets value patents as highly as many researchers do, patents should have a major influence on financial returns of a firm We used patents granted in the United States as our metric of patents because (1) most firms that seek patents tend to patent their significant innovations in the United States, (2) patent laws vary considerably across nations, and thus patents in the United States are a reasonable standard for cross-national comparisons, and (3) U S patents are the most widely accepted measure of patents used in cross-national studies of patenting (see Furman, Porter, and Stern 2002) We weighted the patents by their forward citations because doing so captures the importance of the patents rather than merely their volume (Griliches 1984, Jaffe, Trajtenberg, and Henderson 1993)[7] We collected the patent and citation data from Delphion for the year before the survey

The measures of the control variables in Equation 2 include the national GDP, population, inflation, national credit rating, the firm's citation-weighted U S patent output, and the firm's size in sales revenue We control for industry in both Equations 1 and 2 as follows We identified the two-digit Standard Industrial Classification code for the primary industry in which each firm operates and used this information to run industry-level fixed-effects estimations of Equations 1 and 2

Results

We describe the results in four parts response to the survey, validity and reliability of the measures, the drivers of radical innovation, and the financial impact of radical innovation In addition, Appendix A explores the robustness of our results, including the potential for mediating and moderating effects on the dependent variables

Survey Response

The response rates to our survey vary between 9% and 34% across nations, with an overall average response rate of 19% (see Table 1) These rates compare well with those in other large-scale international studies (e g , Baim 1991) Nevertheless, we also checked for nonresponse bias as follows First, we compared means on the number of employees and total assets (standardized across our sample frame) for respondents and nonrespondents We found no significant difference between respondents and nonrespondents on these demographic measures This pattern also holds for most comparisons at other levels of analysis (within nations, across the four strata of firm size in our sampling plan, and across strata within each nation) Second, we compared means on important variables in the survey for respondents in the first versus last quartile in terms of date of response after the mailing We performed this analysis across nations and found no significant difference in means for most of our variables in most nations These results provide some assurance that our data do not suffer from nonresponse bias

Respondents to the survey have substantial experience (they average 17 4 years of experience in their industry and 12 4 years of experience in their firm) and are closely involved in innovation activities (average level of personal involvement in innovation activities is 5 8 on a seven-point Likert scale anchored by "not at all involved" [1] and "highly involved" [7]) After cleaning the survey data and accounting for missing values, we have a sample size of 772 We then integrate the archival firm and national data with the survey data and achieve a sample size of 759 To our knowledge, this is the largest sample among multicontinent studies of firm innovation (for descriptive statistics, see Table 3) We first present the results of the estimation of our measurement model and then present the results of our formal tests and additional analyses

Reliability and Validity

Following Anderson and Gerbing (1988), we assessed the measurement model before estimating the research model To obtain reliable and valid measures of our focal variables, we first examined the face validity, interitem, and item-to-total correlations to arrive at the scales we described previously All scales show satisfactory reliabilities, with Cronbach's alphas above the acceptable cutoff of 60 (except willingness to cannibalize, which has an alpha of 58)

Next, we used confirmatory factor analysis to examine the unidimensionality of the constructs (i e , the extent to which a single construct underlies a set of measures [items]) The overall fit of the measurement model provides the necessary information to determine whether unidimensionality is satisfied (Gerbing and Anderson 1988, Steenkamp and Van Trijp 1991) The overall fit of the full model is satisfactory (Browne and Cudeck 1993)

To check for discriminant validity of the latent constructs, we constrained the correlation between each pair of latent constructs to 1, the constrained models show evidence of poor fit relative to the freely estimated equivalent Lagrange-multiplier tests indicated no significant cross-loadings, thus providing further evidence of discriminant validity The preceding tests provide support for the psychometric adequacy of our measures

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[7] We also ran our models with patent counts only and found that our results are robust to this measure

TABLE 3
Descriptive Statistics

Conceptual Variable: Level of Analysis	Variable	M	SD	Minimum	Maximum
Radical Innovation					
Firm	Radical product innovation	12 39	3 87	3	21
Financial Performance					
Firm	Market-to-book ratio	90	1 21	3 × 10^{-4}	11 93
Labor					
Nation	National labor	–2 91 × 10^{-9}	97	–2 20	1 53
Firm	R&D employees/all employees	3 60	1 39	0	7
Capital					
Nation	National capital	–6 66 × 10^{-9}	98	–2 18	1 33
Firm	R&D spending/sales revenue	3 27	1 16	1	7
Government					
Nation	Government	–2 18 × 10^{-9}	91	–2 56	1 80
Culture					
Nation	Religion % Catholic	19 06	25 12	0	85 5
	Religion % Protestant	17 01	23 88	0	94
	Religion % Buddhist	20 56	34 08	0	93
	Religion % Muslim	2 60	3 65	0	14 9
	Religion % Hindu-Sikh	3 25	15 38	0	82 4
	Religion % nonaffiliated	18 94	21 45	0	95
	Geographic location distance from equator	1926 57	585 99	56 84	3038
	Values power distance	49 90	14 65	31	80
	Values individualism	57 26	28 96	17	91
	Values masculinity	56 45	18 40	5	95
	Values uncertainty avoidance	58 78	21 33	8	92
	Values long-term orientation	47 50	31 875	0	118
Firm	Attitude willingness to cannibalize	12 49	3 34	3	21
	Attitude future market orientation	16 40	3 95	4	28
	Attitude risk tolerance	15 42	4 27	4	28
	Practice product champions	10 40	2 26	2	14
	Practice incentives	7 64	2 73	2	14
	Practice internal markets	3 91 × 10^{-4}	79	–1 75	2 64
Control Variables					
Nation	Country GDP	2363 09	3308 48	90 24	10,445 63
	National population	167 23	304 36	4 2	1294 4
	Inflation	1 39	1 51	–3	4 3
	National credit rating	82 60	12 29	46 7	95 3
Firm	Citation-weighted patents	5 21	44 429	0	1046
	Firm size	1,431,539	5,641,951	–111,669	6 40 × 10^{7}

Drivers of Radical Innovation

Recall that our theory suggests that corporate culture is a primary driver of radical innovation, in addition to the effect of government, firm, and national labor, capital, and culture Equation 1 specifies the model that captures this theory The results (standardized coefficients) of the test of this model appear in Table 4 To show robustness of the results to multicollinearity, we present the results in six nested versions of Equation 1 We highlight the key results

Model 5 shows that most of the traditional variables from the literature have little effect on radical innovation after we account for corporate culture Model 5 also shows that five of the six measures of corporate culture (all except internal markets) have effects that are significantly greater than zero Based on standardized coefficients and t-statistics, the effects of future market orientation, willingness to cannibalize, and tolerance for risk are particularly strong Although the effects of incentives and product champions are relatively weaker, they are still significantly larger than zero A reason for this difference may be because attitudes are a more proximate driver of innovation than practices Other important results that emerge from Table 4 are that citation-weighted patents do not affect radical innovations Conversely, firms' R&D activities, measured as the percentage of R&D employees to all employees, have a significant, positive effect on radical innovation Indeed, R&D may be a measure of a firm's commitment to innovation, at least in technology-driven markets

TABLE 4
Estimates of Independent Variables on Radical Innovation (Equation 1)

Conceptual Variable: Level of Analysis	Independent Variable	Model 1: National Culture Only	Model 2: Corporate Culture Only	Model 3: Corporate and National Culture	Model 4: All Alternative Hypotheses	Model 5: Full Model	Model 6: Model 5 Without Religion
Labor							
Nation	National labor				– 12	– 01	01
Firm	R&D employees/all employees				13*	11**	11**
Capital							
Nation	National capital				– 14	– 17	– 10
Firm	R&D spending/sales revenue				10	04	04
Government							
Nation	Government				12	08	05
Culture							
Nation	Religion % Catholic				11	13	
	Religion % Protestant				01	– 08	
	Religion % Buddhist				26	12	
	Religion % Muslim				– 11	– 15	
	Religion % Hindu-Sikh				15	16	
	Religion % other				– 02	– 00	
	Geographic location distance from equator				17	13	01
	Values power distance	– 09		– 09	10	04	– 01
	Values individualism	– 07		– 10	05	– 04	03
	Values masculinity	02		01	– 01	– 02	01
	Values uncertainty avoidance	– 03		001	– 28	– 28	– 07
	Values long-term orientation	– 03		01	– 15	– 01	05
Firm	Attitude willingness to cannibalize		11*	11*		10*	10*
	Attitude future market orientation		11*	10*		13*	12*
	Attitude risk tolerance		25*	27*		23*	24*
	Practice product champions		10*	10*		10*	10*
	Practice incentives		10*	10*		09*	10*
	Practice internal markets		06	06		03	04
Control Variables							
Nation	Country GDP				04	07	– 03
	National population				– 11	– 17	– 08
Firm	Citation-weighted patents				03	02	02
	Firm size				06	04	05
	R^2 overall	05	25	26	13	29	29
	Adjusted R^2	00	22	22	05	23	23
	AIC	3424 7	3243 1	3247 6	3398 5	3247 5	3245 4

*p < 01
**p < 05
Notes All survey measures are corrected for midpoint and extreme response bias All coefficients are standardized values AIC = Akaike information criterion

Note that none of the measures of religion have an impact on radical innovation (Model 4 and 5) However, the measures of religion correlate with national culture, as measured by Hofstede's (2003) variables, causing multicollinearity between these two sets of variables To examine whether this multicollinearity affects the other results, we drop the religion variables from the full model (see Model 6) and find that significance levels and standardized coefficients of the other variables remain essentially unchanged

Thus, for our sample of firms and nations, few of the national variables are significant drivers of radical innovation This result holds across a plethora of robustness tests, including tests of mediation and moderation (see Appendix A) However, two broad drivers of radical innovation emerge as important firms' corporate culture and their investments in skilled labor

Financial Impact of Radical Innovation

An additional objective of this research is to establish the financial value of radical innovation Table 5 presents the results of the impact of radical innovation on financial performance, as measured by firms' market-to-book ratio Model 1 in Table 5 reveals that radical innovation has a significant effect on the market-to-book ratio, even after we control for industry fixed effects Furthermore, Model 2 in Table 5 reveals that radical innovation continues to have a significant effect on the market-to-book ratio in the full model, which includes other firm and national variables This model also indicates that at the firm level, skilled labor, which we measure as a ratio of R&D employees to all employees, is a strong predictor of market-to-book ratios, while patents, a commonly used measure of innovation, are not At the national level, we find that national capital and national population have a significant impact on the market-to-book ratio In summary, our results suggest that (1) markets strongly reward radical innovation beyond any returns to patents, R&D, and other control variables and (2) radical innovation is a more powerful metric of commercial value/performance than patents

Conclusions

This study leads to two important conclusions First, several factors do not seem to be as important drivers of radical innovation in firms across nations as many researchers believe Among these are some frequently emphasized metrics of national labor, capital, government regulation, and culture In contrast, internal corporate culture is an important driver of radical innovation The reasons we propose for this pattern of results are as follows The current economic environment is characterized by increasing globalization and the lowering of barriers to mobility of labor and capital This "flattening" is often accompanied by the rapid adoption of best practice and policy by governments The rapid progress of India and China presents some evidence of these factors in operation In such an environment, national drivers are unlikely to be major discriminators of firms' performance, at least in the 17 nations we sample In addition, firm and national factors have different levels of sensitivity, this is because firm factors reflect the unique features of each firm, while national factors are common across all firms in the country Indeed, corporate culture is a factor that is unique, intangible, sticky, and difficult to change Moreover, success in one generation of technology can breed attitudes of complacency and invulnerability with

TABLE 5
Estimates of Radical Innovation on Market-to-Book Ratio (Equation 2)

Conceptual Variable: Level of Analysis	Variable	Model 1: Radical Innovation Only	Model 2: Full Model
Radical Innovation			
Firm	Radical product innovation	10*	06**
Labor			
Nation	National labor factor		001
Firm	R&D employees/all employees		14*
Capital			
Nation	National capital factor		23*
Firm	R&D spending/sales revenue		05
Government			
Nation	Government factor		07
Control Variables			
Nation	Country GDP		07
	National population		27*
	Inflation		– 06
	National credit rating		03
Firm	Citation-weighted patents		03
	Firm size		– 03
	R^2 overall	15	27
	Adjusted R^2	0	21
	AIC	2066 8	1989 9

*p < 01
**p < 05
Notes All survey measures are corrected for midpoint and extreme response bias All coefficients are standardized values AIC = Akaike information criterion

a focus on managing current products and protecting current profits that brought that success These cultural traits can blind a firm to radical innovations on the frontier Thus, maintaining a culture of relentless innovation is difficult

Some examples illustrate the main results we obtain. A traditionally innovative nation, such as the United States, can be home to innovative firms, such as Apple or FedEx, and lumbering ones, such as Kodak and Kmart Innovative firms such as Samsung (Korea) and Infosys (India) in traditionally lagging economies can leapfrog ahead of slumbering giants in traditionally advanced economies Indeed, the corporate culture in some of these innovative firms develops precisely to overcome aspects of their home economies that would otherwise hinder them Thus, national factors, such as government, culture, labor, and capital, are not unimportant Rather, in the current environment among the 17 economies in our sample, corporate culture seems to be more important than these traditional country drivers in predicting radical innovation in firms across nations

Second, we find that radical innovations translate into financial value to the firm The importance of this finding lies in our measurement of radical innovations with a survey but financial value with archival, publicly available data Thus, the result underscores the validity and importance of our measure of radical innovation Such innovation significantly increases market-to-book value, even after we control for patents, R&D, and other variables Significantly, patents—a measure of innovation widely used in previous research—are not as important in influencing financial value as radical innovations in firms

Implications

The prior analysis and our findings lead to some important implications for managers, researchers, and policy makers First, our study suggests that firms are special forms of organizations that increasingly transcend national boundaries, constraints, and systems Innovative firms, it would seem, are similar They share the same cultural practices and attitudes despite differences in location However, this culture is difficult to observe, measure, and develop We provide a diagnostic tool that can assess the relevant dimensions of culture and enable firms to benchmark themselves against others of their size, history, or industry Thus, managers can be attuned to these cultural factors, can measure them, and can foster them to maintain a culture of relentless innovation Such a focus may bear more tangible fruit than one that relies on government to invest in or protect markets Indeed, the appeal for government relief and intervention by firms may well be a cover for cultural deficiencies in their organizations that they may have previously overlooked

Second, we identify specific attitudes and practices within innovative firms that make them special and foster a culture that helps drive radical innovation The attitudes include a willingness to cannibalize, future market orientation, and risk tolerance, while the practices include empowering product champions and providing incentives for enterprise Firms, such as Apple, that have such cultural attitudes and practices are distinct and excel at radical innovation (Tellis and Golder 2001) They do not need to count patents and engineers Indeed, Apple's "best feat may be the culture that helps generate so many folks who've gone on to create great products elsewhere" (*BusinessWeek Online* 2005)

Third, our study highlights the usefulness in a cross-national context of an output-based measure of radical innovation (i e , radically new products) over surrogates, such as patents and national scientific talent, used in the past (Acs and Audretsch 1987, Von Hippel 2005) Measuring radical innovation directly enables firms and nations to gauge where they really stand on the ultimate outputs that count rather than on inputs or intermediate outputs that reflect costs This measure can enable firms and governments to channel resources toward drivers that matter and to ensure that the entire process of innovation is efficient and productive

Fourth, patents, a measure often used as a surrogate for radical innovation, turn out not to significantly affect firm capitalization and radical innovation These results are robust and not due to model design or multicollinearity Firms and policy makers have probably used patents because they are easily measured, seem to be a precondition for innovation, or seem to offer protection to intellectual property However, many high-tech firms now realize that patents provide only partial protection for their inventions, and firms can be highly innovative without patenting In this context, as a senior vice president of research at a *Fortune* 50 firm in the United States noted, "We have many technologies and patents sitting on the shelf Our problem is getting them out to market!" So, firms and nations need to focus primarily on outputs such as radical innovation rather than on inputs such as patents, or they should at least focus on converting inputs into outputs This conversion is not obvious, as our results and many contemporary examples show For example, innovative Apple, with a little more than a hundred patents, stole Sony's market for mobile music, while Sony, with thousands of patents, refrained from cannibalizing its successful Walkman and music businesses

In summary, our results question some long-held premises about radical innovation, suggest a direct measure for the construct, and outline the attitudes and practices within a firm that support innovation Authors who debate national labor, capital, culture, or government policy may be underappreciating the innovative revolution within firms Policy makers who rely exclusively on the plausible metrics of scientific talent, patents, and intellectual property protection may be missing the real battle taking place The battle is within It is a cultural one between glorifying the past or being paranoid about the future (Grove 1996), between protecting successes or cannibalizing them (Chandy and Tellis 1998), between averting risk or embracing it The battle is for the soul of the firm Innovative firms are those that clearly understand this battle and adopt decisive practices to win it

Limitations and Further Research

Limitations of this study suggest three major research themes that could prove groundbreaking First, we do not explore whether radical innovation leads to national wealth in addition to firm value Current studies of nations' wealth attribute such wealth to natural resources, economic capital, talent, or favorable regulation Further research could ascertain whether innovation is an important driver of national wealth in addition to the previously mentioned factors Such research would have significant policy implications in addition to implications for managers of firms

Second, consumer innovativeness and firm innovation have been topics of extensive research in marketing and strategy To date, research has not attempted to join these two fields of inquiry Further research could ascertain whether the innovativeness of consumers in a country drives or is influenced by the innovation of firms in that country The findings of that research would have significant implications for our understanding of whether and when radical innovation is a market-driven versus a market-driving phenomenon

Third, we do not study subsidiaries of multinational firms A worthwhile extension of this study would be to explore whether corporate culture is strong enough to hold across various subsidiaries located thousands of miles apart in widely different nations and cultures This topic is of special importance as firms rush to establish innovation centers in distant locales

In addition to the major research themes we have discussed, our research also suggests some methodological extensions First, our measures of corporate culture are from self-reports, while those for country variables are from secondary sources A major challenge for researchers is to develop and gather hard measures of culture, such as those we use for patents, R&D expenditures, and financial returns (Rindfleisch et al 2007) Such measures would obviate the concern that some of our results may be affected by measurement error or differences in the level of measurement

Second, recent research (Wong, Rindfleisch, and Burroughs 2003) has shown that mixed-worded scales can cause problems in reliability and factor loading In this research, we use mixed-worded scales to reduce the systematic bias due to the use of a particular response style within a particular nation (Baumgartner and Steenkamp 2001) Use of such scales might account for why the Cronbach's alphas of our scales are sometimes lower than the more desirable cutoff of 70

Third, we restrict our sample to 17 nations These results may not hold for nations wrecked by political instability or riddled with corruption, nepotism, or war Conversely, small, highly innovative nations, such as Israel, or highly populous nations, such as Indonesia and Brazil, may hold special lessons that further research can uncover In particular, research on these nations might shed more light on the ways firm and national factors are likely to interact and intersect in driving innovation

Finally, our sample of firms is restricted to publicly listed firms in each nation In nations such as China, where the population of publicly listed firms is not very large, our sample frame is necessarily small Generalizations beyond such firms should be made with caution and care and after much further research

Appendix A
Tests of Robustness

1. Are Our Results Driven by Common Method Bias?

Common method bias is irrelevant when testing Equation 2 because the dependent variable in this equation (market-to-book ratio) uses data from a set of secondary sources that are entirely independent of the sources of data for virtually all the independent variables in this equation (see Podsakoff et al 2003) Indeed, the results for this equation help validate our survey-based measures because they demonstrate that our survey-based measure of radical innovation is a powerful predictor of financial outcomes measured in a future period by independent sources

To check whether common method poses problems in Equation 1, we conduct two additional analyses First, we employ Harmon's one-factor test for common method bias Specifically, we perform a confirmatory factor analysis (see Podsakoff et al 2003) in which we link all items in our corporate culture (independent) variables as well as our radical innovation (dependent) variable to a single latent factor The results of this analysis strongly reject the single-factor hypothesis, thus alleviating some concerns about common method bias

Second, to further alleviate concerns regarding common methods in Equation 1, we examine the correlations between two nomologically related constructs—radical innovation and patents In our survey, we ask respondents to report on both radical innovation in their firm and the number of U S patents granted to their firm in the previous year (2003) If common methods bias is pervasive in our data (e g , as a result of social desirability), firms would respond similarly on both radical innovation and patents We find that this is not the case None of the items that make up our measure of radical innovation correlate with our measure of patents granted Moreover, the information from the survey-based measure of patents matches closely with that from Delphion, an independent (secondary) source of patent data All these analyses indicate that our results are not driven by common method bias

2. Do the Results Change if Country Factors Are Modeled as Fixed Effects?

An alternative approach to the theory-based approach we use to model country-level factors is simply to use country-specific dummy variables to account for the unobserved heterogeneity that is due to each nation in our sample (see Baltagi 2005) The results from such an analysis (which are available from the authors on request) indicate that, in general, the effects of corporate culture are consistent with those in the results we presented previously

3. Does Corporate Culture Mediate the Effect of National Culture on Radical Innovation?

A key question is whether national culture affects corporate culture or whether the latter mediates the effect of the former on radical innovation (Kirca, Jayachandran, and Bearden 2005) To address these questions, we carry out a formal test of mediation Baron and Kenny (1986) list three conditions that must hold for mediation to exist We test for the existence of each of these conditions in our data and find that none are satisfied As such, the effects of national culture on innovation are not mediated by internal (firm) culture

Specifically, Condition 1 states that the exogenous variables and the proposed mediator must each be significantly related to the dependent variable when considered separately In our case, this condition requires that the national and corporate culture variables, taken separately, should each have a significant impact on innovation We find that this condition does not hold The coefficients of corporate culture (in the regression that does not include national culture) are significant (see Model 2 in Table 4) However, the coefficients of the national culture variables (in the regression that does not include corporate culture) are not significantly different from zero (see Model 1 in Table 4)

Similarly, Condition 2 states that the exogenous variables should be significantly related to the proposed mediator In our case, this would suggest that the national culture variables should have a significant impact on corporate culture This condition, which is crucial for mediation, does not hold The results of a regression of corporate culture on the national culture variables indicate that none of the national culture variables have a significant impact on corporate culture

Finally, Condition 3 states that the relationship between the exogenous variables and the dependent variable should be weaker (for partial mediation) or nonsignificant (for full mediation) when the proposed mediator is included in the model than when the mediator is not included In our case, this condition requires that the coefficients of the national culture variables on innovation should be significantly smaller when corporate culture is included in the model than when it is not included This condition for mediation also does not hold The coefficients of the national culture variables in the regression that does not include corporate culture are identical to those in the regression that does include corporate culture (both sets of coefficients are not significantly different from zero)

Thus, not only does corporate culture not mediate the effect of national culture on radical innovation, but its effect also does not arise from national culture In our sample of publicly held firms in 17 leading economies, the latter does not affect radical innovation at all

4. Do Firm and Nation Factors Interact to Drive Radical Innovation?

Some authors have implied that firm and national factors may interact to drive innovation (see Bartholomew 1997, Murtha, Lenway, and Hart 2001, Nelson 1993) To test for this possibility, we ran several models that included first-order interactions between the key firm and national factors in our model in addition to including all the main effects about which we theorize We find that most of the interaction coefficients are not significantly different from zero, moreover, the pattern of results is not consistent with any systematic effects that would be predicted by the literature Given these results, we conclude that further study of the interaction between national and firm drivers of innovation would be a promising avenue for theoretical and empirical work

5. Do the Effects of Corporate Culture Vary by Nation?

To examine this question, we first run random coefficient regression models (Raudenbush and Bryk 2002) that allow the coefficients of each corporate culture variable to vary across nations We find that the full model, in which all corporate culture coefficients vary by nations, does not converge We then run separate random coefficient regressions, such that a single corporate culture coefficient varies randomly across nations in each regression equation In each of these equations, we find that none of the corporate culture coefficients vary significantly across nations We also run a random-intercept regression, in which random variations from the intercept reflect national unobserved heterogeneity We find that the intercept for the radical innovation equation does not vary significantly across nations and that all effects of the corporate culture variables remain substantively similar to those we reported previously Finally, a model that incorporates heterogeneity through latent class analysis also yields similar results These analyses indicate consistency in the effects of corporate culture on radical innovation across the nations in our sample

6. Do Our Survey Measures Have Cross-Cultural Equivalence?

Our survey measures rely on respondents interpreting key constructs, such as radical innovation, in a consistent manner across nations To ensure this, we take several steps (see Harkness, Van de Vijver, and Mohler 2003) (1) translation and back translation to ensure consistency in the meaning of constructs and items across different languages, (2) a clear definition of radical innovation while anchoring it in two universal examples (the compact disc player relative to cassette tapes and record players and the microwave oven relative to conventional ovens), and (3) in-depth, face-to-face interviews with managers from different cultural contexts (Germany, the United Kingdom, Korea, India, Japan, and China)

In addition, we test our data for metric equivalence across nations Because testing for metric invariance in eight constructs across 17 nations would require a far larger sample size than ours, we create four groups of nations that share a similar cultural and economic background The group "English speaking" includes Canada, the United States, the United Kingdom, and Australia All European nations (Italy, Germany, the Netherlands, France, Switzerland, and Sweden) are grouped together The group "emerging nations" includes China, India, Taiwan, Korea, Singapore, and Hong Kong Japan is a fourth group because it does not fit with any other group Following Steenkamp and Baumgartner (1998), we first test the hypothesis of full metric invariance by constraining the matrix of factor loadings to be invariant across groups Because there is a significant increase between the configural model and the full metric model invariance ($\Delta\chi^2(42) = 76\,966$, $p =\ 001$), we do not find support for full metric invariance

However, prior research has suggested that "full measurement invariance is particularly unlikely" (Steenkamp and Baumgartner, 1998, p 81) and should be considered scientifically unrealistic (Horn, McArdle, and Mason 1983), while partial metric invariance can be regarded as sufficient to establish cross-cultural equivalence (Byrne, Shavelson, and Muthen 1989) To identify the source of lack of full metric invariance, we examine the difference between each pair of factor loadings We find that only 23% (13 of 57) of the pairs of factor loadings are significantly different across nations, moreover, there are no clear patterns in these differences These findings are largely consistent with Steenkamp and Baumgartner's (1998) To test for partial metric invariance, we free up the constraints on the model parameters and find that the partial metric invariance model is not significantly different from the configural model ($\Delta\chi^2(34) = 32\ 192$, $p = 566$) Furthermore, the partial metric invariance model shows better fit than the configural model because the root mean square error of approximation and the consistent Akaike information criterion, which take into account both goodness of fit and model parsimony, are lower Thus, we find support for partial metric invariance in our data Overall, these results provide some evidence of cross-cultural equivalence in our survey measures

APPENDIX B
Key Measures in Survey

	Standardized Factor Loadings	t-Value	Composite Reliability
Radical Product Innovation			
Primary Measure			73
1 Our firm rarely introduces products that are radically different from existing products in the industry (R)	70		
2 Our firm lags behind others in introducing products based on radically new technologies (R)	74	12 94	
3 We have no difficulty in introducing products that are radically different from existing products in the industry	37	8 37	
Alternative Measure			
% of total sales revenue from radical product innovations introduced by our firm in the last three years (2001–2003) (1 = 0%, 2 = 0%–1%, 3 = 1%–5%, 4 = 5%–10%, 5 = 10%–20%, 6 = 20%–30%, and 7 = over 30%)			
Willingness to Cannibalize			65
1 We are very willing to sacrifice sales of our existing products to improve sales of our new products	71		
2 We tend to oppose new projects that could take away from sales of our existing products (R)	32	8 17	
3 We will not aggressively pursue a new technology that causes existing investments to lose value (R)	56	8 13	
Future Market Focus			66
1 Our firm gives more emphasis to customers of the future relative to current customers	38	7 13	
2 Market research efforts in our firm are aimed at obtaining information about customers' needs in the future, relative to their current needs	50	8 49	
3 We are slow to detect fundamental shifts in our industry (e g , competition, technology, regulation) (R)	52	9 01	
4 Our firm is oriented more toward the future than the present	57		
Risk Tolerance			72
1 Managers in our firm rarely take risky decisions (R)	71	11 29	
2 Relative to other firms, we tend to favor higher-risk, higher-return investments	57	10 47	
3 We are reluctant to engage in untested business ventures (R)	54		
4 We believe it is often necessary to take calculated risks	44	8 82	
Product Champions			56
1 Employees with new product ideas receive no support in our firm (R)	70	6 77	
2 Top managers in our firm strongly support champions of ideas for new products	39		
Incentives for Enterprise			77
1 We provide generous monetary rewards to innovative employees	66	9 25	
2 We provide many non-monetary rewards (e g , recognition, autonomy) to innovative employees	82		

APPENDIX B
Continued

Autonomy			74
1 All new product and process decisions in our firm require the approval of the corporate office (R)	88	9 23	
2 Few strategic actions can be taken in divisions in our firm until the corporate office approves these actions (R)	72		
Internal Competition			68
1 Divisions in our firm frequently enter markets served by other divisions	64	6 54	
2 Divisions in our firm actively compete with each other to gain new markets	84		

Notes R = reverse-coded item All items are seven-point Likert-type scales anchored by "strongly disagree/strongly agree" unless indicated otherwise

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Product Innovations, Advertising, and Stock Returns

Under increased scrutiny from top management and shareholders, marketing managers feel the need to measure and communicate the impact of their actions on shareholder returns. In particular, how do customer value creation (through product innovation) and customer value communication (through marketing investments) affect stock returns? This article examines, conceptually and empirically, how product innovations and marketing investments for such product innovations lift stock returns by improving the outlook on future cash flows. The authors address these questions with a large-scale econometric analysis of product innovation and associated marketing mix in the automobile industry. They find that adding such marketing actions to the established finance benchmark model greatly improves the explained variance in stock returns. In particular, investors react favorably to companies that launch pioneering innovations, that have higher perceived quality, that are backed by substantial advertising support, and that are in large and growing categories. Finally, the authors quantify and compare the stock return benefits of several managerial control variables. The results highlight the stock market benefits of pioneering innovations. Compared with minor updates, pioneering innovations have an impact on stock returns that is seven times greater, and their advertising support is nine times more effective as well. Perceived quality of the new car introduction improves the firm's stock returns, but customer liking does not have a statistically significant effect. Promotional incentives have a negative effect on stock returns, indicating that price promotions may be interpreted as a signal of demand weakness. Managers can combine these return estimates with internal data on project costs to help decide the appropriate mix of product innovation and marketing investment.

Keywords: marketing investments, advertising, financial performance, product innovations, stock returns, marketing and firm value, stock return response models

Marketing managers are under increasing pressure to measure and communicate the value created by their marketing actions to top management and shareholders (Lehmann 2004; Marketing Science Institute 2004). These demands create a need to translate marketing resource allocations and their performance consequences into financial and firm value effects (Rust et al. 2004). In particular, how do customer value creation (through product innovation) and customer value communication (through marketing investments) affect stock returns? Several studies have identified innovation success as a key contributor to both long-term firm sales and financial and stock market performance (Pauwels et al. 2004). In the same vein, Drucker (1973) cites innovation and marketing as the two factors crucial to long-term corporate health. However, new product failure rate is high (ranging from 33% to more than 60%) and has not improved over the past decades (Boulding, Morgan, and Staelin 1997; Sivadas and Dwyer 2000). Hauser, Tellis, and Griffin (2006) note that for each new product success, the process begins with six to ten concepts that are evaluated as they move from opportunity identification to launch. The high costs and risks involved with new products are the main culprit for the decline in both new-to-the-world (–44%) and new-to-the-company (–30%) innovations between 1990 and 2004 (Cooper 2005). The stock market's reaction to new products is not guaranteed to be warm either. For example, Boeing's stock price surged 7% when it scrapped development plans for the 747X in January 1997, and it declined 1.7% when the company revived the idea two years later—at a cost of $4 billion—to compete with the Airbus 380 (Dresdner Kleinwort Benson Research 2000; *The Wall Street Journal* 1997). Similarly, there is pressure on marketing managers to demonstrate the contribution of advertising to financial performance. This is not surprising given weak evidence for the profit contribution of advertising spending (Hanssens, Parsons, and Schultz 2001).

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Although the consumer response effects of marketing are well researched, a better understanding is needed of marketing's impact on investor response, which is typically measured by stock returns. Investors are motivated by cash flow expectations—in particular, the prospect of enhancing and accelerating future cash flows and of reducing associated risks (Srivastava, Shervani, and Fahey 1998). Moreover, many marketing actions are costly, and investors consider both their (expected) benefits and their downsides. Furthermore, the stock return impact of marketing actions needs to be assessed in the presence of other important drivers, as identified in the accounting and finance literature (Fama and French 1992; Kothari 2001). Thus, our central research question is, To what extent do marketing actions improve stock returns beyond the typical finance and accounting benchmark measures?

Our empirical research focuses on one industry, automobiles, to enhance its internal validity. Moreover, we believe that findings in this industry will be generalizable to other settings because a meta-analysis (Capon, Farley, and Hoenig 1996, p. 214) indicates few industry-specific effects of innovation performance, and though high returns need not be sustainable in any particular market, the process of generating high returns can be sustainable.

The automobile industry is of substantial economic importance, representing more than 3% of the U.S. gross domestic product (J.D. Power and Associates 2002). In addition, the industry relies heavily on new products, promotional incentives, and advertising. The main thrust of competition is in product development, with each company competing in multiple market segments "with a plethora of niche models designed to attract a particular group of consumers, and to renew them rapidly enough to keep interest fresh" (*The Economist* 2004, p. 14). However, the costs of such design changes can be substantial, and their success is far from certain. Therefore, large automobile firms face substantial innovation investment decisions across distinct product categories (called "segments" in industry parlance) that differ in category attractiveness and competitive conditions. Furthermore, automobile manufacturers invest billions of dollars every year in various forms of advertising to influence customers and prospects to buy their products and services. General Motors alone spent more than $2.8 billion in 2004 to advertise its lines of automobiles (TNS Media Intelligence 2005). However, concerns persist about the financial impact and wisdom of such substantial communications spending.

We organize the remainder of this article as follows: First, we develop the research framework and specify a comprehensive stock return response model to quantify the relationships. Second, we discuss the marketing and financial data sources and estimate the models. Third, we formulate conclusions, cross-validate the empirical results, and discuss their implications for marketing strategies.

Research Framework

We begin with the established financial benchmark—that is, Fama and French's (1992, 1993) three-factor model—and then augment it with Carhart's (1997) proposed momentum factor to obtain the four-factor model. This model produces a better estimate of expected stock returns than the capital asset pricing model. The four-factor model posits that the expected rate of return of a stock portfolio is a function of risk factors that reflect the market, size, book-to-market, and momentum factors. In addition, previous literature in accounting and finance has demonstrated that stock returns react to changes in firm financial measures, including firm results such as revenues and earnings (e.g., Kothari 2001). Controlling for these factors, we develop a conceptual framework to capture the effects of marketing activity on stock returns. We argue that such impact on firm valuation may occur through one or more of four routes: (1) enhancing cash flows, (2) accelerating cash flows, (3) reducing vulnerability in cash flows, and (4) increasing the residual value of the firm.

First, marketing investments, which can involve substantial costs in the short run, can increase shareholder value by enhancing the level of cash flows (i.e., more cash), namely by increasing revenues and lowering costs. For example, automobile innovations that are responsive to unmet customer needs in specific segments, including the Ford Mustang for young drivers and the Chrysler minivan for families with children, have resulted in substantial revenue increases for these companies. Second, marketing investments can enhance shareholder value by accelerating the receipt of cash flows (i.e., faster cash). This is especially important in high-fixed-cost industries that depend on fast turnovers to finance their operations. For example, aggressive advertising helps develop instant awareness of new products that may accelerate the diffusion process. Third, marketing investments can increase shareholder value by lowering the vulnerability and volatility of these cash flows (i.e., safer cash), which results in a lower cost of capital or discount rate (Srivastava, Shervani, and Fahey 1998).[1] Thus, all else being equal, cash flows that are predictable and stable have a higher net present value and thus create more shareholder wealth. For example, advertising may help smooth out the variability in highly seasonal demand patterns or, alternatively, may accentuate them (e.g., Fischer, Shin, and Hanssens 2007). Fourth, marketing investments may increase the residual value of the firm. Building brands and keeping them relevant and distinctive (e.g., by pioneering innovations) increase the equity of the brands owned by the firm and, thus, its residual value.

Marketing actions can influence the outlook for investors on enhancing, accelerating, and stabilizing the firm's cash flows and increasing its residual value. We formulate the hypotheses in this section in terms of which brand-level marketing actions influence the stock returns, modeled through the main effect and the interaction effect with new product introductions Figure 1 and Table 1 present a summary of these drivers and their hypothesized effects

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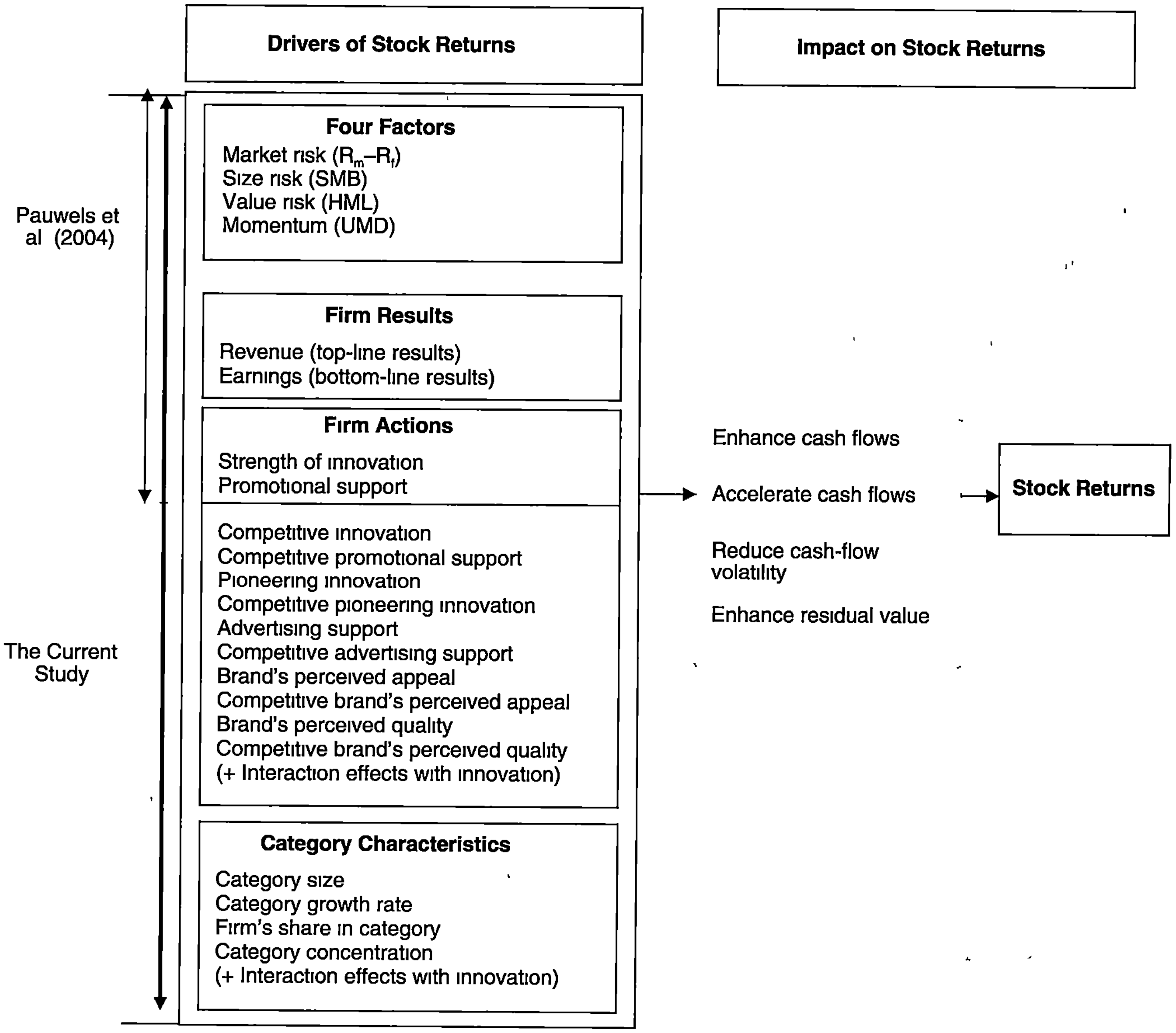
[1] A good example of these intertemporal effects in the car industry is a "lease pull ahead" program. Analysts at car manufacturers keep track of the patterns of lease expirations. When they spot a month in the future with an unusually large volume of lease returns, they offer some lessees the option to return the car ahead of time, coinciding with a period of lower expected lease returns, or offer a promotional extension of the lease term. Furthermore, it is a common practice to target lease programs to terms coinciding with an expected "valley" in lease returns. By seeking a stable flow of lease returns, manufacturers aim to generate a stable flow of new leases.

Marketing Actions and Stock Returns

Innovativeness The innovativeness, or relative advantage of new products, is a consistently important determinant of accelerated consumer adoption rate (Holak and Lehmann 1990) and new product success (Montoya-Weiss and Calantone 1994) On the basis of venture portfolio theory (Booz Allen Hamilton 1982), we can classify the extent of innovation in new products on two dimensions (1) new to the company and (2) new to the market[2] The first dimension measures the extent to which the new product introduction is innovative compared with the firm's existing products The second dimension measures the extent to which the firm's new product is a new introduction to the market An example of a new-to-the-company innovation within the automobile industry context is the Porsche Cayenne, which was the first sport-utility vehicle (SUV) developed by the company (and thus scores high on the first dimension, offering Porsche loyals the opportunity to drive

FIGURE 1
Conceptual Framework



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[2] Specifically, we are interested in the extent to which a new automobile model introduced is different from current offerings of the firm and those in the market We do not consider specific innovations in processes or components

TABLE 1
Marketing Drivers of Stock Returns

Hypotheses and Drivers	Enhancing Cash Flows	Accelerating Cash Flows	Reducing Volatility of Cash Flows	Residual Value	Net Effect on Unexpected Stock Returns
H_1 Innovation level	+	?	+	+	++
H_2 Pioneering innovation	+	?	?	+	++
H_3 Advertising support	+	+	?	+	++
H_4 Promotional support	+/–	+	?	–	–
H_5 Customer liking	+	?	+	+	++
H_6 Perceived quality	+	?	+	+	++

Notes: + denotes that the driver has a positive effect, – denotes that the driver has a negative effect, +/– denotes that the driver could have either a negative or a positive effect, ? denotes no a priori hypothesis on the driver's effect, and ++ denotes that the driver has a net positive effect.

an SUV) but which entered a market already full of SUVs, including the sports car–based BMW X5 (and thus scores low on the second dimension). An example of a new-to-the-market innovation is the Toyota Prius hybrid. We discuss the impact of these innovation dimensions in turn.

New-to-the-company innovations. Renewing products is widely regarded as necessary for long-term survival and as an engine of growth, thus enhancing cash flows and future profitability (Chaney, Devinney, and Winer 1991; Sorescu, Shankar, and Kushwaha 2007). Recent evidence on new product introductions in the context of the personal computer market suggests that enhancement in cash flows occurs as a result of reduced selling and general administrative expenses (Bayus, Erickson, and Jacobson 2003). On average, the greater the new product's improvement over previous versions, the better is its long-term financial performance, and the greater is its firm value impact (Pauwels et al. 2004). In line with the J.D. Power and Associates expert rating scale, we consider the range from mere trimming and styling changes (Levels 1 and 2) to design and new benefit innovations (Levels 3 and 4) to brand entry in a new category (Level 5) in the empirical analysis (Pauwels et al. 2004).

Developing new products faster and moving them into production can accelerate cash flows from product innovation (Srivastava, Shervani, and Fahey 1999). In contrast, many products have failed to realize their potential because of insufficient attention to speeding up the market acceptance cycle for these products (Robertson 1993). Large companies, especially, have been criticized for delaying the renewal and upgrade of their product offerings in the face of changing consumer preferences (Ghemawat 1991). Furthermore, the success of innovations depends on consumers' timely adoption of the innovation, with both consumer and market factors being important drivers of the trial probability (e.g., Gielens and Steenkamp 2003).

Companies can reduce the vulnerability of their cash flows by completing their product portfolio with new-to-the-company products that enable them to address new consumer segments. For example, Toyota reduces cash flow volatility by offering a full line of products and managing the migration of customers from its economy models to its luxury cars—for example, from Yaris to Corolla or from Camry to Lexus ES. Furthermore, synergies between and within product lines, including sharing components and design elements across such different products, can reduce production costs and inventory risk (Fisher, Ramdas, and Ulrich 1999). In addition, a higher innovation level may also increase the residual value of the company. In the face of shifting demand and fickle consumer preferences for the newest products, brands with more improvements from one model to the next are more likely to remain fresh and, thus, relevant to today's and tomorrow's consumers.

Finally, recent empirical evidence has suggested a nonlinear effect of the innovation level on new product success. On the demand side, Gielens and Steenkamp (2003) find a U shaped effect of product novelty on product trial probability. Within a range of (nonradical) innovations, such as those in their and our study, consumers prefer either low complexity (minor update) or high relative advantage (new market entry). Moderate innovations typically do not offer (much) more advantage over minor innovations (Kleinschmidt and Cooper 1991) and thus appear stuck in the middle. On the supply side (Sherman and Hoffer 1971), design and new benefit innovations (Levels 3 and 4 on our scale) are much costlier than mere trimming and styling changes (Levels 1 and 2). For example, Cadillac's Escalade SUV innovation cost General Motors approximately $4 billion (White 2001). Thus, combined with the U-shaped demand impact, financial performance shows a U-shaped impact of innovation level (Pauwels et al. 2004). Between minor updates and new market entries, the latter are better news for the firm's future value because "products high on newness provide an especially strong platform for growth" (Gielens and Steenkamp 2007, p. 104). Although minor innovations are necessary to maintain the stable stream of cash flows from "bread-and-butter" products (e.g., Toyota's frequent minor updates to Camry), major product updates are better able than minor product updates to enhance cash flows (Kleinschmidt and Cooper 1991) and, thus, stock returns. In summary, we expect that the stock return benefits have a U-shaped relationship to each innovation level in this scale, with a preference for new market entries over minor updates.

H_1: (a) New-to-the-company innovations increase stock market returns, and (b) stock returns are U shaped in the level of new-to-the-company innovation.

New-to-the-market (pioneering) innovations Although new product introductions benefit stock returns on average, new-to-the-market products have a greater impact (Chaney, Devinney, and Winer 1991) Indeed, the new product literature has consistently related innovation success to a product's ability to provide benefits and features not offered by alternative products (Henard and Szymanski 2001, Holak and Lehmann 1990) Pioneering innovations have a greater potential to unlock previously unmet customer needs and, thus, ultimately to surpass "me-too" innovations in terms of enhancing cash flows (Kleinschmidt and Cooper 1991, Moorman and Miner 1997)

It is not clear a priori whether pioneering innovations accelerate cash flows compared with other innovations On the one hand, relative advantage is a consistently important determinant of accelerated adoption rate (Holak and Lehmann 1990) On the other hand, consumers may also consider pioneering innovations riskier, which delays adoption (Gatignon and Robertson 1985)

Finally, pioneering innovations also stand out as reducing cash flow vulnerability and raising residual value Indeed, although the short-term risk may appear to be higher, pioneering products also have option value, that is, they offer "the possibility of greater long-term financial gain given the possibility of their revolutionizing a product category" (Moorman and Miner 1997, p 94) Indeed, firms can reduce the vulnerability of their cash flows by staying ahead of competition in product innovation and introducing difficult-to-copy new products Moreover, investors may view such pioneering innovations both as platforms for future product introductions and as signals that the firm is successful in the innovation process itself Therefore, their view of the residual value of the firm is likely enhanced Finally, pioneering innovations offer new strategic choices for the firm by providing the opportunity to leverage these innovations to future products For example, DuPont has leveraged its invention of nylon and Teflon in a series of successful new product introductions in a variety of categories At the same time, radical pioneering innovations are likely to increase the volatility of cash flows in the short run but can eventually lead to stable cash flows A notable example of a radical pioneering innovation is the Toyota Prius hybrid, which is tracking to commercial success as a result of radical but visionary strategy Overall, we postulate the following

H_2 Pioneering (new-to-the-market) innovations have a greater stock return impact than no-pioneering innovations

Advertising support Research over the past decade has shown that marketing activity, such as advertising, can lead to more differentiated products characterized by lower own–price elasticity (Boulding, Lee, and Staelin 1994) In turn, this enables companies to charge higher prices, attain greater market share and sales (Boulding, Lee, and Staelin 1994), command consumer loyalty (Kamakura and Russell 1994), and thus ward off competitive initiatives Empirical evidence from the automobile market suggests that advertising expenditures generate greater cash flows for pioneers than for later entrants (Bowman and Gatignon 1996) Therefore, advertising support for innovations, especially pioneering innovations, can enhance cash flows for the company

In addition, advertising builds awareness, which is an essential component of new product success For example, Bly (1993, p 125) notes that the "new-product innovator will spend more than twice as much on advertising and promotion as a business with fewer new products " Recent evidence suggests that firms that invest more in marketing resources can better sustain the innovation and thus accelerate the adoption rate of their new products (Chandy and Tellis 2000) These benefits can lead to cash flow acceleration

Finally, investments in the brand through advertising can reduce consumers' perceived risk, particularly for radical innovations (Dowling and Staelin 1994) As such, differentiation of a brand through advertising may lead to monopolistic power, which can be leveraged to extract superior product-market performance, thus leading to more stable (i e , less vulnerable to competition) earnings in the future (Srivastava, Shervani, and Fahey 1998) Conversely, advertising spending can exacerbate or smooth seasonal demand patterns, leading to either an increase or a decrease in volatility, respectively

Likewise, the increased brand differentiation through advertising should increase the residual value of the firm Moreover, investors may perceive enhanced residual value through advertising exposure beyond its impact on firm financial performance (Joshi and Hanssens 2007) Therefore, we hypothesize the following

H_{3a} Advertising support for new-to-the-company innovations increases the stock market returns of these innovations

H_{3b} Advertising support for pioneering innovations increases the stock market returns of these innovations

Although we expect that advertising works for both new-to-the-company and new-to-the-market innovations, the latter should benefit most Indeed, advertising works best when the firm has something new to offer the consumer (Lodish et al 1995) When the product innovation is so pioneering that it (temporarily) dominates the competition, firms may even reap permanent benefits from their advertising campaigns (Hanssens and Ouyang 2002) Therefore, we expect the following

H_{3c} Advertising support benefits the stock market returns more for pioneering innovations than for new-to-the-company innovations

Promotional support The power of sales promotions to enhance future cash flows has been investigated extensively in empirical research On the one hand, sales promotions are effective demand boosters because they often have substantial immediate effects on sales volume and profits (Dekimpe and Hanssens 1999) In terms of the conceptual framework, the main power of price promotions is to accelerate cash flows, which is why managers often use them to reach sales quotas on time (e g , Lee, Padmanabhan, and Whang 1997) On the other hand, promotions also signal a weakness in the customer value of the product relative to competition, particularly in the context of new product introductions (Pauwels et al 2004)

To the extent that sales promotions have positive short-term effects on top-line and bottom-line performance (Nijs et al 2001, Srinivasan et al 2004), the use of sales promotions would accelerate cash flows However, because promotion effects on sales are typically short lived, any positive cash flow response will dissipate quickly

In addition, for durable products (and particularly for automobiles), manufacturers need to build and commit capacity before the product is launched Promotions and price discounts could signal that the new product is performing below expectation in terms of sales, which in turn would lead to either low-capacity utilization or a chronic dependence on price discounts Thus, price discounts could be interpreted as signaling profit compression in the future Especially important for automobiles, price promotions on new vehicles may reduce the secondhand and trade-in market for used vehicles, which in turn affects the residual value of the firm's portfolio of leased cars Therefore, we postulate the following

H_4 Promotional support for new-to-the-company innovations decreases the stock market returns of these innovations

Customer perceptions of brand defects and brand perceived quality In general, marketing theory predicts greater success for firms that serve the needs of their customers better, especially by providing products that are superior to the competition in the customers' eyes (Griffin and Hauser 1993) Within the automobile industry, management can significantly improve a company's fortunes by introducing new products with superior features and minimal deficiencies (e g , General Motors' recent push for more pleasing new cars with fewer defects) Customer-focused measures of these improvements include customer liking, quality, and satisfaction In markets for pioneering innovations, prior evidence suggests that the initial growth in customer base and revenue is largely due to perceived quality improvements by incumbents as well as new entrants (Agarwal and Bayus 2002) In other words, innovations that create and deliver added consumer value contribute significantly to the success of brands (Kashani, Miller, and Clayton 2000)

Apparently, investors view the quality signal as providing useful information about the future-term prospects of the firm Changes in perceived quality are associated with changes in stock returns (Aaker and Jacobson 1994, Tellis and Johnson 2007) Favorable perceptions of product quality and value by customers lead to differentiation and higher brand loyalty, which in turn lead to higher buyer switching costs that can be exploited to enhance current profitability and cash flows or to increase the residual value of the firm

A priori, it is unclear whether customer liking and perceived quality will also accelerate cash flows Regarding cash flow stability, brands with favorable perceptions of product quality likely enjoy a greater degree of "monopolistic competition" power In other words, high customer quality perceptions represent competitive barriers that reduce price elasticity and generate more stable (i e , less vulnerable to competition) earnings in the future In summary, we postulate the following

H_5 Customer liking of new product introductions increases stock returns

H_6 Perceived quality of new product introductions increases stock returns

Category Characteristics

We consider four category characteristics the control variables—category size, category growth rate, a firm's share of the category, and category concentration—on the basis of previous literature (e g , Capon, Farley, and Hoenig 1996) Although previous marketing literature enabled us to formulate hypotheses on the impact of marketing actions on stock returns (H_1–H_6), our empirical analysis is exploratory, given the need for studies that examine the impact of category characteristics on stock returns As such, we formulate expectations about the direction of the effects rather than formal hypotheses at this juncture

Category size[3] The strength of category demand is an important factor in brand success, and firms neglect market size assessment at their own peril (Cooper and Kleinschmidt 1993, Henard and Szymanski 2001) On the one hand, large categories enable firms to spread their fixed research-and-development and launch costs over a greater number of potential customers On the other hand, large categories are also attractive to competitors and thus will draw more competitive innovation and attention Going after larger categories may also reduce the vulnerability of a firm's cash flows If the new product introduction misses its intended mark, other consumers in the large category may have an interest For example, when Cadillac launched a redesigned Escalade SUV in 2002, it became highly successful with an unintended market segment—professional athletes, rappers, and celebrities In turn, Cadillac has begun to pursue these trendsetters by giving them previews of the next-generation Escalade, by offering them limited-edition versions, and so forth (Eldridge 2004) Moreover, large categories may provide a better cushion against damage by competitive marketing actions or exogenous changes (Aaker and Jacobson 1990)

Category growth rate Firms that target high-growth categories achieve higher sales and better financial performance, leading to enhanced cash flows (Capon, Farley, and Hoenig 1996) Moreover, competitive reactions to new product introductions are likely to be less aggressive when the incumbent sales continue to grow at a satisfactory rate, which would be the case when the product innovation increases primary demand (Frey 1988) Likewise, advertising reactions to new product introductions are less likely in growing versus static categories (Cubbin and Domberger 1988) In turn, this lower competitive intensity leads to enhanced cash flows Moreover, investments are preferentially directed toward high-growth categories and away from established businesses in slower-growth categories

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[3] Within the context of the automobile industry, there are six categories based on the accepted industry classifications SUVs, minivans, midsize sedans, compact cars, compact pickups, and full-size pickups

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(Wensley 1981) because the expected payoff is better in high-growth categories Similarly, when the category demand is growing, it is easier for all competitors to acquire customers rapidly, leading to acceleration in cash flows (Cooper 1999, Scherer 1980)

Finally, commitment of marketing resources in emerging-growth categories reduces risk in the future Indeed, investors are likely to reward share gains in growing categories because the returns are expected to grow as the category grows

Firm's share of category The firm's current market share in a category may affect its long-term performance in several ways A firm's high market share typically results from a strong relative advantage in the served segment (Phillips, Chang, and Buzzell 1983), which in turn enhances cash flows At the same time, dominant firms have more to lose from cannibalization (Chandy and Tellis 2000), which could jeopardize the price premiums on their established products This has an opposite impact on cash flows In addition, it is unclear a priori to what extent the firm's share of the category affects the acceleration of cash flows from new product introductions Finally, the volatility of cash flows is reduced when the firm has a dominant market share and therefore is more likely to retain a large proportion of customers on an ongoing basis (Srivastava, Shervani, and Fahey 1998) However, firms with a large share of a category may become complacent in that category as their managerial priorities shift to other, higher-growth opportunities (Kashani 2003), leading to increased vulnerability in cash flows Given these opposing forces, we explore the effect of firm category share

Category concentration A brand's success critically depends on competitive category conditions, including category concentration (Capon, Farley, and Hoenig 1996, Cooper and Kleinschmidt 1993) Economic theory suggests that in concentrated categories, profit margins are higher Moreover, companies in concentrated categories are less motivated to engage in price wars because they dissipate the attractive margins Thus, increases in category concentration are more likely to increase cash flows and, thus, stock returns Finally, faced with only a few competitors, a firm is less likely to be surprised by disruptive innovations that affect the stability of its income streams Therefore, category concentration will likely reduce the vulnerability of cash flows

Research Methodology

We use stock return response modeling to assess the degree to which marketing actions and category conditions improve the outlook on a firm's cash flows and thus lift its stock price In essence, stock return response modeling establishes whether the information contained in a measure is associated with changes in expectations of future cash flows and, thus, stock price and returns (for a review, see Mizik and Jacobson 2004) We present a "unified" estimation of firm stock returns by specifying a model that enables us to assess the proposed hypotheses directly

Stock Return Response Modeling

It is well known that the economic return to a marketing activity, such as a new product introduction, is obtained over the long run (e g , Pauwels et al 2004) Therefore, we may consider a firm's marketing activity an intangible asset that influences future cash flows As such, "the value of a marketing strategy to the firm can be depicted as a discounted present value of the future cash flows generated through the use of this marketing strategy" (Mizik and Jacobson 2003, p 67)

The stock market valuation of a firm depicts the market expectations of these discounted future cash flows The efficient market hypothesis implies that stock prices follow random walks, the current price reflects all known information about the firm's future earnings prospects (Fama and French 1992) For example, investors may expect the firm to maintain its usual level of advertising and price promotions Developments that positively affect future cash flows result in increases in stock price, whereas those that negatively affect cash flows result in decreases Whereas changes to typical marketing time series, such as consumer sales, are mostly temporary (Dekimpe and Hanssens 2000, Ehrenberg 1988), changes to stock prices are predominantly permanent (Fama and French 1992, Malkiel 1973) By taking the first differences of the logarithm of stock prices, a stationary time series of stock returns is obtained as a dependent variable In the context of this article, regressing stock returns against changes in the marketing mix provides insights into the stock market's expectations of the associated long-term changes in cash flows

Assessing the Impact of Marketing Actions on Stock Returns

The framework for assessing the information content of a measure enjoys a long tradition in both finance (e g , Ball and Brown 1968) and marketing (see, e g , Jacobson and Aaker 1993, Madden, Fehle, and Fournier 2006) The latter research stream has attempted to assess the stock market reactions to nonfinancial information, including firms' customer-based brand equity (Aaker and Jacobson 2001, Barth et al 1998), brand extension announcements (Lane and Jacobson 1995), online channel addition (Geyskens, Gielens, and Dekimpe 2002), and a shift in strategic emphasis from value creation to value appropriation (Mizik and Jacobson 2003) In the tradition of stock return response modeling, these studies test for incremental information content—that is, the degree to which a series explains stock price movements beyond the impact of current accounting measures, such as revenue and earnings

We begin with a well-established benchmark in the finance literature—that is, the four-factor explanatory model, which estimates the expected returns ($Eret_{it}$) as a function of risk factors that reflect the general stock market, size, the relative importance of intangibles (book-to-market ratio), and momentum (Fama and French 1992, 1993) Riskier stocks are characterized by higher returns, so smaller firms are expected to outperform larger firms, stocks with higher book-to-market ratios are expected to outperform stocks with lower book-to-market ratios, and stocks with higher momentum (i.e., high past return) are expected to outperform stocks with lower momentum. The typical financial benchmark model for stock returns is estimated as follows:

$$(1)\qquad R_{it} - R_{rf,t} = \alpha_i + \beta_i(R_{mt} - R_{rf,t}) + s_i SMB_t + h_i HML_t + u_i UMD_t + \varepsilon_{it},$$

where R_{it} is the stock return for firm i at time t, $R_{rf,t}$ is the risk-free rate of return in period t, R_{mt} is the average market rate of return in period t, SMB_t is the return on a value-weighted portfolio of small stocks less the return of big stocks, HML_t is the return on a value-weighted portfolio of high book-to-market stocks less the return on a value-weighted portfolio of low book-to-market stocks, and UMD_t is the average return on the two high prior return portfolios less the average return on the two low prior return portfolios (i.e., momentum). Moreover, ε_{it} is the error term, α_i is the model intercept, and β_i, s_i, h_i, and u_i are parameter estimates of the four factors used in the model. The SMB and HML factors are constructed using portfolios formed on size and book to market, and the UMD factor is constructed using portfolios formed on prior 2- to 12-month returns.[4] If the stock's performance is "normal," the four-factor model captures the variation in R_{it}, and α_i is zero.

Next, we augment the financial benchmark model (Equation 1) with marketing variables to test hypotheses on their impact on future cash flows. As argued previously, we express the marketing variables in unanticipated changes—that is, deviations from prior behaviors that are already incorporated in investor expectations. We define the model at the brand level and the category level as follows:

$$\begin{aligned}(2)\quad R_{it} - R_{ft} = {} & Eret_{it} + \beta_1 U\Delta INC_{it} + \beta_2 U\Delta REV_{it} \\ & + \sum_{l=1}^{5} \beta_3 U\Delta INND_{ijkt,l} + \beta_4 U\Delta CINN_{ijkt} \\ & + \beta_5 PION_{ijkt} + \beta_6 CPION_{ijkt} \\ & + \sum_{own=1}^{4} \beta_{7,own} U\Delta OMKT_{ijkt,own} \\ & + \sum_{cross=1}^{4} \beta_{8,cross} U\Delta CMKT_{ijkt,cross} \\ & + \sum_{n=1}^{4} \beta_{9,n} U\Delta CAT_{kt,n} + \gamma_1 U\Delta INC_{it} \times U\Delta INN_{ijkt} \\ & + \gamma_2 U\Delta REV_{it} \times U\Delta INN_{ijkt} \\ & + \sum_{own=1}^{4} \gamma_{3,own} \times (U\Delta OMKT_{ijkt,own} \times U\Delta INN_{ijkt}) \\ & + \sum_{own=1}^{4} \gamma_{4,own} \times (U\Delta OMKT_{ijkt,own} \times PION_{ijkt}) \\ & + \sum_{cross=1}^{4} \gamma_{5,cross} \times (U\Delta CMKT_{ijkt,cross} \times U\Delta INN_{ijkt}) \\ & + \sum_{n=1}^{4} \gamma_{6,n} \times (U\Delta CAT_{kt,n} \times U\Delta INN_{ijkt}) + \varepsilon,\end{aligned}$$

where R_{it} is the stock return for firm i at time t, $Eret_{it}$ is the expected return from the Fama–French benchmark model in Equation 1, and the subscripts j and k denote the brand and category and *l* denotes the innovation level. The inclusion of brand and category subscripts is relevant for two reasons. First, since the stock return impact is likely to be different across brands and categories because of cross-sectional heterogeneity, it is important to account for such heterogeneity from an econometric perspective. Second, managers want to pinpoint which brands (e.g., those with more versus less advertising support, innovation level, and quality) and/or targeted categories contribute more or less to the firm's stock return. The subscripts "own" and "cross" denote own and competitive marketing variables (advertising, promotional incentives, liking, and quality). The subscript n denotes the category variables (size, growth rate, concentration, and the market share of the firm in the category). The unexpected components of stock returns are of two kinds: results and actions or signals. Results include unanticipated accounting earnings (UΔINC) and revenues (UΔREV). Specific marketing actions or signals are the unanticipated changes to brand innovation (UΔINND), to pioneering innovations (PION), and to advertising, promotions, customer liking, and perceived product quality to the brand (UΔOMKT). Competitive actions or signals in the model are the unanticipated changes to competitive brand innovation (UΔCINN), to competitive pioneering (CPION), and to competitive advertising, promotions, customer liking, and perceived quality (UΔCMKT). Finally, category variables (UΔCAT) include category size, category growth rate, category concentration, and the firm's market share in the category (to capture cannibalization effects), and ε_{it} is the error term. Note that we include the possibility for interactions of each marketing variable with both the innovation level (UΔINN) and the pioneering nature of the product innovation (PION). The unanticipated components are modeled with either survey data of analysts' expectations or time-series extrapolations (Cheng and Chen 1997). This study follows the latter approach, using the residuals from a time-series model as the estimates of the unanticipated components.

In stock return response models, such as the one we described previously, a test of "value relevance" of unexpected changes to firm results and actions is a test for significance of the β and γ coefficients; significant values imply that these variables provide incremental information in explaining stock returns.[5] Empirically, we estimate using a fixed-effects cross-sectional time-series panel model to control for unobserved brand and firm characteristics We test for pooling versus estimating a fixed-effects cross-sectional time-series panel model to evaluate the significance of the cross-section effects using the sums-of-squares F-test and the likelihood function using EViews 6 0 (2007, p 568) Because we have multiple observations by firm (i e , multiple brands of the same firm in up to six categories, as we describe in the "Data and Variable Operationalization" section), we use seemingly unrelated regression estimation to account for the contemporaneous correlations

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[4] More details on the four factors and related data are available on Kenneth French's Web site (see http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

[5] It would be ideal to run the regression $RET^{BRAND} = bX + \mu$, where RET^{BRAND} is the return associated exclusively with the par-

Data and Variable Operationalization

We focus on the 1996–2002 automobile industry's "big six"—Chrysler, Ford, General Motors, Honda, Nissan, and Toyota—which represent approximately 86% of the U S car market Sales transaction data from J D Power and Associates are available for a sizable sample of dealerships in the major metropolitan areas in the United States For the sales promotions, we use data from California dealerships, which contain every new car sales transaction in a sample of 1100 dealerships from October 1996 to June 2002 [6] Each observation in the J D Power and Associates database contains the transaction date, manufacturer, model year, make, model, trim and other car information, transaction price, and sales promotions (operationalized as the monetary equivalent of all promotional incentives per vehicle) [7] The vehicle information is aggregated to the brand, representing a brand's presence in each category (e g , Chevrolet SUV) Table 2 clarifies the variables, their definitions, specific data sources, and the temporal and cross-sectional aggregation of each variable Importantly, note that a certain brand can experience an innovation at several weeks during a year because its (sub)models introduce their new versions at different times We consider 53 brands in six major product categories SUVs, minivans, midsize sedans, compact cars, compact pickups, and full-size pickups (see Table 3) [8]

Another source of J D Power and Associates data is expert opinions on the innovation level of each vehicle redesign or introduction We obtained these data from the work of Pauwels and colleagues (2004), which provides an extensive discussion of those data

For the "pioneering" innovation variable, in line with the J D Power and Associates (1998) guidelines, experts rate innovativeness as pioneering or not An example of Level 1 for the premium car category is the 2001 Toyota Prius, the first gasoline–electric hybrid that could function as a versatile family car For the SUV category, an example of a pioneering innovation is the 1999 Lexus RX 300, the first car-based SUV designed to compete in the luxury SUV segment Table 4 provides specific illustrations of pioneering innovations

Another important set of J D Power and Associates data is the annual surveys of the Automotive Performance, Execution and Layout (APEAL) Study and of the Initial Quality of cars, based on feedback from more than 60,000 customers on the experience of the first months of ownership The former is a customer-driven metric of "things gone right," which measures customers' perceptions on the design, content, layout, and performance of their new vehicles during the first three to seven months of ownership We use this measure to operationalize customer liking The latter, which is our measure of perceived quality, is based on feedback from more than 60,000 customers on the experience of the first 90 days of ownership and measures the number of problems by each brand, essentially, this is a measure of "things gone wrong" (see Table 2) [9] A final source of data is advertising data from TNS Media Intelligence on monthly advertising expenditures by make and model in each of the six categories

We obtain stock returns from the Center for Research in Security Prices The data source for the four factors is Kenneth French's Web site at Dartmouth (see n 4) For firm-specific and quarterly accounting information, such as book value, revenues, and net income, we use Standard & Poor's COMPUSTAT database The COMPUSTAT data set also provides monthly indexes of the Consumer Price Index, which is used to deflate the monetary variables To obtain weekly Consumer Price Index data, we linearly interpolated the monthly numbers (see Franses 2002) Table 5 provides the descriptive statistics for the measures that form the basis of our analysis We choose the week as the time interval of

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ticular brand information X However, given the corporate nature of stock returns, the regression we estimate is $RET = \beta X + \varepsilon$, where RET is the total corporate stock return, which is composed of RET^{BRAND} and $RET^{NOT\text{-}BRAND}$ (i e , the stock return that is not associated with the brand) Because $RET = (RET^{BRAND} + RET^{NOT\text{-}BRAND})$, it can be shown that the least squares estimate of $E[\beta] = E[(X'X)^{-1}X'(RET^{BRAND} + RET^{NOT\text{-}BRAND})] = b$ (Geyskens, Gielens, and Dekimpe 2002, Lane and Jacobson 1995), leading to an unbiased estimate under the reasonable assumption that $RET^{NOT\text{-}BRAND}$ and X are uncorrelated As a further test of this assumption, we estimate an expanded model that includes cannibalization effects of other brands owned by the same firm and find that our substantive results are robust to this issue (for details, see n 12)

[6] With the exception of price promotions, all the other variables come from national sources In the auto industry, it is typical for promotions to be planned and executed at the national level, and they are advertised nationally through television networks As such, the price promotions data from California are representative of the price promotions of other U S regions

[7] Moreover, this data set is at the detailed "vehicle" level, defined as every combination of model year, make, and model (e g , 1999 Honda Accord, 2000 Toyota Camry), body type (e g , convertible, coupe, hatchback), doors (e g , two-door, four-door, four-door extended cabin), trim level (e g , for Honda Accord, DX, EX, LX), drive train type (e g , two-wheel drive, four-wheel drive), transmission type (e g , automatic, manual), cylinders (e g , four cylinder, six cylinder), and displacement (e g , 3 0 liters, 3 3 liters)

[8] For reasons of parsimony, we restrict our attention to brands that together account for at least 80% of the share of the category under consideration

[9] The customer liking and perceived quality variables are aggregated to the brand level as the market share–weighted average of the respective ratings of the models for brand j This enables us to incorporate the effects of changes in the vehicle model mix on firm valuation For example, if market conditions cause a drop in sales of full-size SUVs relative to midsize SUVs, the product lines of General Motors and Ford become less attractive than those of Toyota and Nissan

TABLE 2
Data: Variable Definitions

Variable	Definition	Source
Dependent Variable		
Stock returns (R_{it})	$(\text{Price}_t + \text{Dividend}_t - \text{Price}_{t-1})/(\text{Price}_{t-1})$	Center for Research in Security Prices
Four Factors		
Market risk (Rm-Rf)	Rm is the average market rate of return, and Rf is the risk-free rate of return	Kenneth French's Web site (see n 4)
Size risk (SMB)	Difference of returns on a value-weighted portfolio of small stocks and the return on large stocks	
Value risk (HML)	Difference of returns on a value-weighted portfolio of high and low book-to-market stocks	
Momentum (UMD)	Difference of the average return on the two high-prior-return portfolios and on two low-prior-return portfolios	
Firm Actions		
Firm income	Firm income, scaled by dividing by firm assets, is the earnings of firm i in week t	COMPUSTAT
Firm revenue	Firm revenue, scaled by dividing by firm assets, is the revenue of firm i in week t	COMPUSTAT
Seasonal and holiday variables	It is set to 1 for one week before the event, during the week of the event, and one week following the event and to 0 otherwise, around the following holidays Labor Day weekend, Memorial Day weekend, and the end of each quarter	
Product innovation	Brand innovation variable for brand j in category k for firm i at time t is defined as the maximum of the innovation variable for all vehicle model transactions in that week, as in Pauwels and colleagues (2004) This variable is used to create the innovation variables that measure each innovation level from 1 to 5	J D Power and Associates expert opinions, J D Power and Associates weekly transactions data
Competitive product innovation	Market share–weighted average of the product innovation of all the other brands (other than the focal brand) in the category	J D Power and Associates expert opinions, J D Power and Associates weekly transactions data
Pioneering innovation	A dummy variable indicates whether the J D Power and Associates experts rate innovations as pioneering (1) or not This variable is set to 1 in the week of introduction of the pioneering innovation and to 0 otherwise	J D Power and Associates expert opinions
Competitive pioneering innovation	This variable is set to 1 in the week of introduction of the pioneering innovation of the other brands (other than the focal brand in the category) and to 0 otherwise	J D Power and Associates expert opinions
Advertising support	Advertising expenditure in millions of dollars for brand j in category k for firm i at time t, scaled by firm assets	TNS Media Intelligence
Competitive advertising support	Market share–weighted average of the advertising support of all the other brands (other than the focal brand) in the category	TNS Media Intelligence
Promotional support	The monetary equivalent of promotional incentives for brand j in category k for firm i at time t, the brand-level calculated by the market share–weighted average of the incentives for all models of brand j in category k, scaled by firm assets	J D Power and Associates weekly transactions data

TABLE 2
Continued

Variable	Definition	Source
Competitive promotional support	Market share–weighted average of the promotional support of all the other brands (other than the focal brand) in the category	J D Power and Associates weekly transactions data
Brand's customer liking	The brand-level measure is calculated as the market share–weighted average of the perceived APEAL rating of the models for brand j in category k at time t This is a customer-driven measure of "things gone right," which measures customer perceptions on the design, content, layout, and performance of their new vehicles during the first three to seven months of ownership	J D Power and Associates survey data for the APEAL measure, J D Power and Associates weekly transactions data
Competitive customer liking	Market share–weighted average of the perceived APEAL of all the other brands (other than the focal brand) in the category	J D Power and Associates survey data for the APEAL measure, J D Power and Associates weekly transactions data
Brand's perceived quality	The brand-level measure is calculated as the market share–weighted average of the perceived quality of the models for brand j in category k at time t This survey, which is based on feedback from more than 60,000 customers on the experience of the first 90 days of ownership, measures the number of problems by each brand and is a measure of "things gone wrong" Thus, the latter Initial Quality Survey measure is negatively signed to obtain the perceived quality metric	J D Power and Associates Initial Quality Survey for the APEAL measure, J D Power and Associates weekly transactions data
Competitive perceived quality	Market share–weighted average of the perceived quality of all the other brands (other than the focal brand) in the category	J D Power and Associates Initial Quality Survey for the APEAL measure, J D Power and Associates weekly transactions data
Category Control Variables		
Category size	Category size is the total sales in week t for category k	J D Power and Associates weekly transactions data
Category growth rate	The metric of interest is the ratio of category growth rate of category k to total growth rate for all auto sales, which yields a measure of relative attractiveness of a category	J D Power and Associates weekly transactions data
Market share	Market share of the firm i in category k in week t	J D Power and Associates weekly transactions data
Category concentration	Category concentration is the sum of the market share of the top three brands within category k in week t	J D Power and Associates weekly transactions data

analysis because (1) previous stock return modeling studies have demonstrated that a few days suffice for studying product innovation (e g , Chaney, Devinney, and Winer 1991), (2) weekly return data guard against noisy day-to-day (or even hour-to-hour) day-trading patterns, and (3) the product innovation variable is available at the weekly level

Because the stock market reacts only to unexpected information, explanatory factors should only reflect unanticipated changes To obtain a measure of unanticipated changes, we estimate a time-series model and use the residuals as the estimates of unanticipated components As an illustration, a first-order autoregressive model has been widely used to depict the time-series properties of firm performance, such as earnings (Y_{it})

$$Y_{it} = \theta_0 + \theta_1 Y_{it-1} + \eta_{it}, \qquad (3)$$

where the coefficient θ_1 is the first-order autoregressive coefficient depicting the persistence of the series and η_{it} provides a measure of unanticipated portion of Y_{it} and is used as the explanatory variable in the estimation of the stock return response model in Equation 2 (In other words, the residuals in Equation 3 provide an estimate of $U\Delta Y_{it}$)

Empirical Results

Table 6 shows the correlations among the variables The variance inflation factors range from 1 18 to 1 72, which is

TABLE 3
Brands of the Six Leading Car Manufacturers

Category	Brands	Chrysler	Ford	General Motors	Honda	Nissan	Toyota
SUVs	15	Dodge, Jeep	Ford Lincoln	Chevrolet Cadillac GMC Oldsmobile Buick	Honda Acura	Nissan Infiniti	Toyota Lexus
Minivans	9	Dodge, Chrysler	Ford Mercury	Chevrolet Oldsmobile	Honda	Nissan	Toyota
Premium midsize cars	9	Chrysler	Ford Mercury	Chevrolet Oldsmobile Buick	Honda	Nissan	Toyota
Premium compact cars	8	Chrysler	Ford	Chevrolet Pontiac Saturn	Honda	Nissan	Toyota
Compact pickups	6	Dodge	Ford	Chevrolet GMC		Nissan	Toyota
Full-size pickups	7	Dodge	Ford Lincoln	Chevrolet GMC Cadillac			Toyota

TABLE 4
Examples of Pioneering Innovations

Category	Pioneering Innovation	Description
Compact car	2001 Toyota Prius	First gasoline hybrid
Truck	2002 Chevrolet Avalanche	Unique convertible cab system to transform from a five-passenger SUV into a standard cab pickup
Truck	2002 Lincoln Blackwood	Introduced as a cross between a luxury SUV and a pickup truck
SUV	1999 Lexus RX 300	First car-based SUV in the luxury segment
Minivan	1999 Honda Odyssey	First introduced the hideaway or "magic seat"

acceptable and suggests that multicollinearity among the variables is not a concern

We first estimate the benchmark four-factor financial model in Equation 1, followed by the focal model in Equation 2[10] The stock return models are statistically significant at $p < 05$ for both the benchmark four-factor financial model and the focal model, including firm results and firm actions We discuss our main results on the benchmark four-factor financial model, Pauwels and colleagues' (2004) model, and the focal model, as well as the robustness of the implied causality from marketing mix to stock market returns

Results of the Benchmark Models

The benchmark four-factor model Are stock returns affected by the four risk factors of size (SMB), the importance of intangibles (HML), risk class (Rm-Rf), and momentum (UMD)[7] As Columns 3 and 4 of Table 7 show, the benchmark four-factor financial model is statistically significant at $p < 05$ with the adjusted R-square of 154 The market-risk coefficient is positive and significant (308, $p < 01$) and different from 1 00, suggesting that the big-six automobile firms have below-average market risk Indeed, consistent with the capital asset pricing model and the four-factor financial model, the coefficient for market risk dominates all other explanatory variables in our models in terms of t-values The coefficient for size risk, SMB, is positive and significant (041, $p < 05$), and the coefficient for value risk is also positive and significant (302, $p < 01$) Thus, these results confirm well-established findings that (1) small caps and (2) stocks with a high book-to-market ratio tend to do better than the market as a whole Notably, the only variable that does not significantly explain stock returns in our data, momentum, represents a later addition to the four-factor model

Pauwels and colleagues' (2004) variables In Columns 5 and 6 of Table 7, we report the results of the stock return response model, adding Pauwels and colleagues' (2004) marketing variables As for the Fama–French factors, SMB,

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[10] Unit root tests reveal evolution in income and revenue but stationarity in stock returns, the marketing variables, and the category-specific variables A cointegration test for the existence of a long-term equilibrium among these evolving variables produced a negative result

TABLE 5
Characteristics of the Six Leading Car Manufacturers 1996–2002

Characteristic	Ford	General Motors	Chrysler	Honda	Nissan	Toyota
U S market share	21%	28%	15%	8%	4%	10%
Market capitalization (in billions of dollars)	48 6	36 7	44 3	34 1	18 5	112 2
Quarterly firm earnings (in millions of dollars)	1,570	1,040	845	530	750	1,015
Quarterly firm revenue (in millions of dollars	37,025	40,600	29,080	12,090	10,765	25,220
Stock market returns (%)	– 077%	086%	199%	– 063%	102%	165%
Brand advertising (yearly, in millions of dollars)	720	1430	660	250	290	400
Number of new product introductions (Levels 1–5)	113	93	67	42	24	56
Sales promotions per vehicle ($)	390	640	640	25	200	120
Customer liking score	603	588	644	601	626	613
Perceived quality score	203	248	187	232	230	226

Notes The values reported are the sample mean of the time series The exception is new product introductions, for which we report the total number

HML, and Rm-Rf remain significant Moreover, the marketing actions regarding innovation and promotion and their firm results regarding revenue and income significantly affect stock returns beyond the four factors Indeed, the "marketing + finance" model explains twice as much variance in stock returns as the nested "finance-only" model Still, our richer focal model outperforms Pauwels and colleagues' (2004) nested benchmark Therefore, we focus on discussing the results of the focal model and return to Pauwels and colleagues' benchmark results in the "Managerial Implications" section for comparison purposes

Focal Model Results

The focal model reported in Columns 7 and 8 of Table 7 is statistically significant (F-value at $p < 05$) The sums-of-squares F-test and the likelihood function test statistics for pooling versus fixed effects reject the null that the fixed effects are redundant ($p < 05$)[11] Notably, the estimated effect of size (SMB) becomes statistically insignificant, indicating that the size effect is likely captured by the firm-specific marketing actions and the results included in the focal modal We tested for autoregressive conditional heteroskedasticity (ARCH) in the residuals using Engle's Lagrange-multiplier ARCH test (Engle 1982, Van Dijk, Franses, and Lucas 1999) and fail to reject the null hypotheses of no ARCH ($p < 01$)

Do Firm Results Drive Stock Returns?

A key question on the firm results side is, Do firm revenue surprises and firm earnings surprises affect stock returns? As Columns 7 and 8 in Table 7 show, the impact of unexpected changes to revenue, or top-line performance, on stock returns is positive and significant (544, $p < 05$) Similarly, the impact of unanticipated changes to income, or bottom-line performance, on stock returns is positive and significant (2 511, $p < 01$) The size of the estimate is similar to that reported previously—for example, Kormendi and Lipe (1987), who report a coefficient of 3 38 These two effects are consistent with the extensive accounting and finance literature (e g , Kothari 2001) that has documented the information content of revenues and earnings measures When an unanticipated change in firm results (e g , earnings) occurs, investors view it as containing information not only about changes in current-term results but about future-term prospects as well This information induces stock market participants to update their expectations about the firm's discounted future cash flows and revise stock price accordingly

Do Firm Actions Drive Stock Returns?

The key question on the firm actions side is, Do firm action surprises affect stock returns?

New-to-the-company innovations In confirmation of H_{1a}, in general, new-to-the-company innovations have a positive and significant impact (546, $p < 01$) This effect is U shaped (see Figure 2) in the level of innovation, with a strong preference for new market entries/Level 5 innovations (981, $p < 01$) over minor updates/Level 1 innovations (546, $p < 01$), lending support to H_{1b} As for competitive new-to-the-company innovations, the main effect of such innovations on stock returns is not significant Thus, it appears that competitive innovations have no incremental information content to investors regarding the focal firm, unless they are new to the market

New-to-the-market innovations Pioneering innovations have a positive and significant impact on stock returns (3 304, $p < 01$), consistent with H_2 Importantly, the advent of pioneering innovations dominates all other explanatory variables in the models As such, pioneering innovations reflect information that affects financial markets' expectations about the firm's future financial performance Likewise, pioneering innovations of competitors have a significant and negative impact on stock returns (– 882, $p < 05$)

Advertising support As noted previously, we test both the main and the interaction effects of marketing support Advertising has positive and significant effects on stock returns (045, $p < 05$) Advertising support for new-to-the-company innovations and pioneering innovations increases the stock market returns of these innovations (055, $p < 05$,

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[11] An argument in favor of a random coefficients model could also be constructed using tests to detect such departure from the constant parameter assumption As such, we tested for this using the variation of the Lagrange-multiplier test (Hsiao 2003, pp 147–49) A chi-square test (using a significance level of $p < 05$) did not reveal departure from the assumption of fixed coefficients

TABLE 6
Intercorrelations Among the Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 Stock return	1 00																		
2 UΔRevenue	04	1 00																	
3 UΔEarnings	04	01	1 00																
4 UΔInnovation	02	−01	00	1 00															
5 UΔCompetitive innovation	10	04	−01	00	1 00														
6 Pioneering	03	00	00	00	−02	1 00													
7 Competitive pioneering	−05	00	01	01	−05	00	1 00												
8 UΔAdvertising	07	11	00	01	11	00	−01	1 00											
9 UΔCompetitive advertising	06	08	00	01	13	00	06	25	1 00										
10 UΔPromotions	−05	−03	00	−02	−02	−01	−02	00	01	1 00									
11 UΔCompetitive promotions	01	−09	03	−02	−03	−01	03	−07	−06	01	1 00								
12 UΔCustomer liking	01	−01	−01	00	01	01	−01	−05	−02	01	02	1 00							
13 UΔCompetitive liking	−07	03	−07	01	06	00	−01	04	08	00	−01	00	1 00						
14 UΔPerceived quality	02	−01	−01	02	−01	00	−01	−01	−03	01	01	46	00	1 00					
15 UΔCompetitive quality	02	00	−01	00	15	03	−02	00	−02	00	03	−06	03	−03	1 00				
16 UΔCategory size	00	−03	−01	−03	03	−03	−04	−10	−03	00	10	01	01	−01	01	1 00			
17 UΔCategory growth	00	−03	00	−02	03	−03	−04	−10	−02	−01	10	−01	01	−03	−03	92	1 00		
18 UΔFirm's share	−03	−01	09	−02	01	−08	−03	−04	00	−01	−02	03	−02	03	00	04	03	1 00	
19 UΔConcentration	02	02	05	02	00	−01	−03	03	00	01	00	01	−07	−03	00	03	07	03	1 00

Notes Correlations are presented as Pearson correlation coefficients and are modest

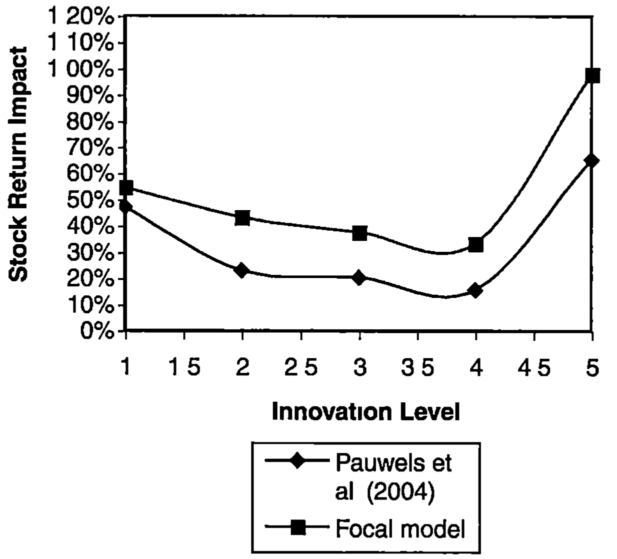
TABLE 7
Drivers of Stock Returns

		Four-Factor Model 1		Pauwels et al. (2004) Variables Model 2: Partial		Focal Model 2: Full	
Variables	**Hypothesis**	**Estimate**	**SE**	**Estimate**	**SE**	**Estimate**	**SE**
Four Factors							
Constant		– 010	035	– 077	086	232	427
R_m–R_f		308*	017	323*	085	350*	020
SMB		041**	019	048**	024	059	039
HML		302*	026	323*	030	373*	034
UMD		051	036	038	038	046	041
Firm Results							
UΔRevenue				468**	224	544**	261
UΔEarnings				2 406*	811	2 511*	802
UΔRevenue × UΔInnovation				1 115	678	118	077
UΔEarnings × UΔInnovation				2 596**	1 133	1 468*	519
Firm Actions							
UΔInnovation Level 1	H_1			473*	140	546*	146
UΔInnovation Level 2	H_1			231**	113	432*	137
UΔInnovation Level 3	H_1			202	125	375	272
UΔInnovation Level 4	H_1			157**	078	335*	103
UΔInnovation Level 5	H_1			654*	223	981*	420
UΔCompetitive innovation						003	047
Pioneering	H_2					3 304*	1 022
Competitive pioneering						– 882**	425
UΔAdvertising						045**	022
UΔCompetitive advertising						– 127	128
UΔAdvertising × UΔInnovation	H_{3a}					055**	023
UΔCompetitive advertising × UΔInnovation						182	170
UΔAdvertising × Pioneering	H_{3b}, H_{3c}					812*	329
UΔPrice promotions				– 002*	000	– 005	003
UΔCompetitive promotions						– 004	004
UΔPrice promotions × UΔInnovation	H_4			– 002*	000	– 002**	000
UΔCompetitive promotions × UΔInnovation						017	111
UΔPromotions × Pioneering						– 018	080
UΔLiking						001	001
UΔCompetitive liking						019	016
UΔLiking × UΔInnovation	H_5					029	019
UΔCompetitive liking × UΔInnovation						– 017	017
UΔLiking × Pioneering						191	190
UΔQuality						011	009
UΔCompetitive quality						– 014*	004
UΔQuality × UΔInnovation	H_6					021*	002
UΔCompetitive quality × UΔInnovation						– 257	251
UΔQuality × Pioneering						158	111
Category Characteristics							
UΔSize						018	212
UΔSize × UΔInnovation						220*	052
UΔGrowth rate						365	1 181
UΔGrowth rate × UΔInnovation						618*	234
UΔShare of category						– 141	128
UΔShare × UΔInnovation						079	962
UΔConcentration						– 432	420
UΔConcentration × UΔ Innovation						129	121
Durbin–Watson statistic for serial correlation		2 072		2 080		2 103	
Adjusted R-square		154		334		472	

*p = 01 (two-sided)
**p = 05 (two-sided)

Notes The model also includes the seasonal dummies and the brand- and firm-specific fixed coefficients, which are not displayed in the interest of space There are 54 brands × 299 weeks in the cross-sectional time-series panel We obtained the Durbin–Watson test statistic using EViews 6 (see Johnston and DiNardo 1997, Chap 6 6 1)

FIGURE 2
Stock Returns and New-to-the-Company Innovations



and 812, $p < 01$), in support of H_{3a} and H_{3b} In other words, advertising support for new products (through the interaction effect) has a positive stock return impact beyond general-purpose advertising (i e , the main advertising effect) Because advertising and innovation are at the brand (or vehicle model) level, advertising support will draw consumer attention to the brand's innovation to subsequently drive customer traffic and new product sales to the dealer From a practical perspective, most brand advertising at the time of a new product launch in the auto industry tends to focus on the innovation itself (e g , the 1999 Honda Odyssey's fold-flat rear seat, the Lexus RX's smooth drive) Overall, our results suggest that the innovation effects are enhanced by advertising support because investors look beyond the advertising expense (which reduces immediate profits) and reward the signal of product support that the brand provides by advertising Advertising support for pioneering innovations appears to be especially effective, in line with H_{3c} Marketing communication works best when managers have something truly new to offer to and communicate with consumers

Price promotions For price promotions, we find that the main effect of these incentives on stock returns is not significant Thus, although promotions are known to be revenue and profit enhancing in the short run, investors do not reward them More important, we find a significant, negative interaction effect (– 002, $p < 05$) for promotions with innovations, in support of H_4 Thus, although advertising support is interpreted as a sign of strength, price promotions may be viewed as a signal that an innovation is weak by investors judging the innovation's impact on future cash flows

Customer liking and perceived quality. With respect to the brand's customer liking and perceived quality, main effects are not significant This is not surprising, because when there is no new product or change in the existing product, we would not expect any change in the brand's liking and quality and, thus, in stock market returns The effect of new product introductions that enjoy more positive scores on customer liking is in the expected direction (H_5), however, it does not reach traditional significance levels New product introductions that enjoy more positive consumer perceptions of quality have systematically higher stock returns (021, $p < 01$), in support of H_6 Our results suggest that improvements in consumer appraisal in terms of perceived quality, particularly for new products, translate into better investor appraisal of firm performance

Do Category Characteristics Drive Stock Returns?

Category size and category growth rate have significant interaction effects with product innovations First, new product introductions have a larger stock return impact in large than small categories (220, $p < 01$) Second, the category growth rate has a significant, positive influence (618, $p < 01$) on stock returns from new product introductions This finding is consistent with the forward-looking nature of investment behavior, that is, investors reward firms that target high-growth-rate categories with new product introductions because they offer the potential of higher sales and financial performance Moreover, the returns from innovating grow as the category grows, and such growth tends to be rewarded all the more by investors[12]

Robustness Test of Endogeneity

Our central hypothesis is that marketing-mix activity, such as product innovation and advertising, improves the outlook on cash flows and thus improves stock returns beyond the known impact of other important variables, such as the firm's net operating income However, an argument could also be constructed in favor of the reverse effect, for example, firms' innovations and advertising levels are based, in part, on their observed stock returns Specifically, marketers might want to incorporate investor behavior in their actions because there may be a "reverse causality" between marketing and stock returns (Markovitch, Steckel, and Yeung 2005)

Under the reverse-causation scenario, firm actions (e g , innovations, advertising levels) are endogenously determined Therefore, we tested for the presence of endogeneity using the Hausman–Wu test (Davidson and MacKinnon 1993, Gielens and Dekimpe 2001) The procedure is implemented as follows for each potentially endogenous variable

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[12] We also examined the robustness of our results with an expanded model that incorporates the effects of other brands owned by the same firm Thus, this model includes two types of competitive variables First, we control for competition from brands of the same firm within the same category to account for cannibalization Second, we consider competition from brands of competing firms in the same category to account for cross-effects We observe no substantial differences in the results between the expanded model and the focal model, indicating that our statistical inference is robust to this issue

In the test equation, we include both the variable and its instruments, which are derived as the forecasts from an auxiliary regression linking the variable to the other control variables A chi-square test on the significance of these instruments then constitutes the exogeneity test None of these tests revealed any violation of the assumed exogeneity of the right-hand-side variables (using a significance level of $p < 05$), indicating that the model specification is robust to this issue

Managerial Implications

To better appreciate the managerial meaning of these results, we juxtapose the consequences of the variables largely under managerial control new product introductions, the pioneering status of the new product introduction, advertising support, promotion support for new product introductions, and improvements in customer liking and perceived quality of new product introductions The first two variables are related to innovation characteristics (i e , value creation), the next two involve marketing support (i e , value communication), and the last two involve both value creation and value communication Therefore, a comparison of these effects may provide valuable input for resource allocation decisions in the new product process Specifically, we calculate the stock return impact of (1) introducing a new product by itself, (2) introducing a pioneering innovation, (3) increasing advertising support for a new product introduction or for a pioneering innovation by $1 million, (4) increasing promotional incentives for a new product introduction by $1,000, (5) increasing customer liking for a new product introduction, and (6) increasing the perceived quality for a new product introduction Of these effects, only the first and fourth have been addressed by Pauwels and colleagues (2004) Table 8 reports the effect sizes and also highlights the new managerial insights (over Pauwels and colleagues') we obtained by comparing Columns 2 and 3 (for a graphical comparison summary of marketing variables' impact on stock returns, see Figure 3)

First, the stock return impact is U shaped with the innovation level, with a preference for new market entries (98%) over minor updates (55%) In comparison, Chaney, Devinney, and Winer (1991) find a stock market impact for new product announcements of approximately 75% These results support the interpretation that investors look beyond current financial returns and consider spillover innovation benefits, which may include increased revenues from opening up whole new markets and reduced costs from applying the innovation technology to different vehicles in the manufacturer's fleet (Sherman and Hoffer 1971) While a new product introduction generates only modest stock return gains, the gain generated by a pioneering new product is much higher at 4 28% Thus, the impact of introducing a pioneering innovation on stock returns is approximately seven times higher than that of introducing a minor update

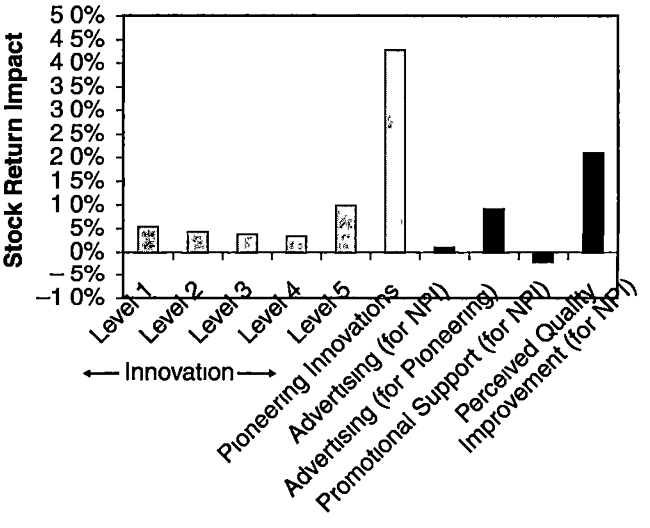
Second, an incremental outlay of $1 million in advertising support of an innovation generates up to 10% in stock returns but up to 91% gains for advertising support of a pioneering innovation Note that these gains occur in addition to the direct sales and profit impact of such advertising support The reverse is true for promotional support for new product introductions and pioneering innovations because these are negative (– 20%) in terms of stock return impact Finally, improvements in perceived quality score by 100 points or a 45% improvement relative to the sample average score of 221 (see Table 5) results in a stock return impact of

TABLE 8
Impact of Firm Actions on Stock Returns

	Effect on Stock Returns	
Impact of . .	Pauwels et al. (2004) Variables (Table 7, Column 5)	Focal Model (Table 7, Column 7)
New Product Introductions		
Level 1	47%	55%
Level 2	23%	43%
Level 3	20%	38%
Level 4	16%	34%
Level 5	65%	98%
Pioneering innovations		4 28%
Advertising support for new product introductions		10%
Advertising support for pioneering innovations		91%
Promotional support for new product introductions		– 20%
Improvement in customer liking for new product introductions		n s
Improvement in perceived quality for new product introductions		2 10%

Notes n s = the estimate is not significant The simulation for the impact of a pioneering innovation is based on the assumption that when a pioneering innovation is introduced, the level of innovation increases from Level 0 to Level 5

FIGURE 3
Marketing Impact on Stock Returns



Notes NPI = new product introduction

2 10% In contrast, financial markets do not seem to incrementally value improvements in customer liking scores for new product introductions The reason for this difference may reside in the sampling of only current car owners, who logically like the car features (thus the low informational value of customer liking, beyond the informational value of measures such as sales and earnings, to future company cash flows) but may or may not have experienced problems (thus the high informational value of perceived quality to future company cash flows, which likely suffer from negative word of mouth and poor retention in the case of negative perceived quality)

Conclusions

This article investigates the impact of new product introductions and the associated marketing investments on stock returns We postulated several hypotheses in this regard that are centered on the role of the marketing mix in enhancing, accelerating, and stabilizing cash flows for the firm and/or increasing its residual value We tested these hypotheses using stock return response modeling on six years of weekly automotive data

First, we conclude that new product introductions have positive postlaunch effects on stock returns These effects are stronger in larger, high-growth categories In addition, the stock return benefits of pioneering (new-to-the-market) innovations are seven times larger than those of innovations that are merely new to the company This finding contrasts with the reality that managers favor the rollout of frequent incremental innovations over that of fewer, more fundamental innovations Such incremental innovations are less costly and risky, which is important in light of the multibillion dollar cost of new car platforms (White 2001) Our research controls for these costs empirically by including firm revenue and earnings performance as drivers of stock returns However, we do not claim to have fully captured the financial and time investment of innovation development Companies should compare our reported findings with their internal data on project costs to help determine the extent to which they should aim for pioneering innovations

Second, the marketing of these innovations plays an equally important role We find that the stock return impact of new product introductions is greater when they are backed by substantial advertising investments In other words, communicating the differentiated added value to consumers yields higher firm value effects of innovations, especially for pioneering innovations In contrast, promotional incentives do not increase firm value effects of new product introductions, because they may signal an anticipated weakness in demand for the new product Third, the stock return impact of new product introductions is higher for innovations with higher levels of perceived quality

This study has several limitations that provide worthwhile avenues for further research First, we analyzed only one industry, albeit an important one in which product innovation, advertising, and consumer incentives are a major part of the marketing mix Therefore, we emphasize that our findings on stock drivers pertain to the automobile industry, and a validation of the results in this study to other industries is an important area for further research Second, we did not consider specific launch strategy or innovation process measures, both of which have been researched extensively in prior literature Third, the focus in this study was on postlaunch effects of innovations, including pioneering innovations on stock market returns As such, we focused on product innovations that made it to market but censored out of the data those that did not make it to market Further research using data on the development costs of innovations, including those that do not make it to market, would enable a direct assessment of the stock return impact of prelaunch effects of innovation Fourth, we did not have data on advertising copy, and thus we leave the issue of advertising copy and effectiveness of new product advertising to further research Finally, we leave the issues of investigating the presence or absence of threshold effects and reciprocal causation of advertising on stock market performance for further research

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Pay What You Want: A New Participative Pricing Mechanism

Pay what you want (PWYW) is a new participative pricing mechanism in which consumers have maximum control over the price they pay. Previous research has suggested that participative pricing increases consumers' intent to purchase. However, sellers using PWYW face the risk that consumers will exploit their control and pay nothing at all or a price below the seller's costs. In three field studies, the authors find that prices paid are significantly greater than zero. They analyze factors that influence prices paid and show that PWYW can even lead to an increase in seller revenues.

Keywords: pay what you want, pay as you wish, participative pricing, service pricing, voluntary contributions

Companies can attempt to differentiate themselves from competitors through their products and services or through their marketing strategy. A key element of the marketing strategy is companies' pricing strategy. Tellis (1986) discusses various pricing strategies that companies can pursue. The key objective of pricing strategies is maximizing sellers' profits by capturing consumers' heterogeneous product valuations and accounting for competition and cannibalization. Furthermore, consumers' reactions to different pricing strategies may not be purely rational but rather driven by behavioral aspects, such as perceptions and preferences. Therefore, consumers' perceptions of different pricing models may be an additional opportunity for companies to differentiate themselves from competition (by applying a preferred or innovative pricing mechanism).

Participative pricing mechanisms, such as auctions and name your own price (NYOP), can be considered innovative, in the sense of being unconventional, because they involve consumers in the price-setting process. Thus, innovative pricing models can be anything that is different from the usual way of setting the price for a specific product. With the advent of the World Wide Web, auction-based pricing mechanisms have been perceived as innovative in selling small-value items, such as collectibles (Lucking-Reiley 2000). Similarly, the NYOP mechanism, in which consumers bid for a product against an undisclosed threshold price set by the seller, can be considered innovative (Amaldoss and Jain 2008; Chernev 2003; Spann and Tellis 2006). Common aspects of these mechanisms are that they allow for differentiated prices accounting for consumer heterogeneity and enable consumers (buyers) to exert some control over the final price for the transaction (i.e., participate in the price-setting process; Spann and Tellis 2006). Chandran and Morwitz (2005) find that participative pricing, and thus the higher perceived control of the buyers, leads to a greater intent to purchase. Moreover, they show that consumers who have experience with participative pricing mechanisms prefer them to predetermined (i.e., posted) prices. In this case, the participative pricing model may attract consumers' attention, potentially leading to (new) customers. Furthermore, the mechanism may increase a seller's popularity by word of mouth. We conjecture that participative pricing models can be perceived as (1) innovative and (2) preferable owing to their inherent delegation of some control over the price-setting process to consumers.

Pay what you want (PWYW) is a participative pricing model in which a buyer's control over the price setting is at a maximum level; the buyer can set any price above or equal to zero, and the seller cannot reject it. The most prominent, recent example of an application of PWYW is that of the rock band Radiohead. For two months, the band offered fans the chance to download its new album from its Web site and to pay as much as they wanted. The album was downloaded more than two million times, and the band reported afterward that this price format was profitable.[1] Among other online downloads (e.g., www.sheeba.ca,

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[1] Radiohead made the offer between October 10 and December 10, 2007. Fans could even pay nothing if they wanted. Only the credit card handling fee of 45p was mandatory. In total, the album was downloaded approximately two million times, and prices ranged from 45p (the transaction fee) to £99.99. According to the lead singer, Thom Yorke, Radiohead profited from the PWYW format, making more money from digital downloads of "In Rainbows" than from digital downloads of all the band's other studio albums combined (see http://www.wired.com/entertainment/music/magazine/16-01/ff_yorke?currentPage=all).

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open-source software), PWYW is also applied in areas such as gastronomy and hotel industries For example, the Pakistani restaurant Wiener Deewan, in Vienna, has been allowing clients to self-determine the prices for their meals since opening in April 2005 Prices for drinks are fixed, but customers can decide how much they want to pay for the food According to press reports and direct interviews with the owner, the business model has been successfully established, and the restaurant even expanded just two months after opening Similar concepts can be found worldwide, such as in Berlin (www weinerei com), Seattle (www terrabite org), and Melbourne (www lentilasanything com) Thus, PWYW appears to be a pricing mechanism that marketers and researchers should consider

Given greater purchase intentions and the preference for participative pricing mechanisms (Chandran and Morwitz 2005), consumers may prefer PWYW because of the level of control offered and the novelty of the mechanism The obvious risk is that customers could exploit their control and pay nothing at all or a price well below the seller's cost In such a situation, the seller would not survive for long In contrast to NYOP and auctions, no minimum price that could protect the seller against such low prices is implemented However, we have observed several sellers that use PWYW successfully and have even expanded their business Thus, it is worthwhile studying customer usage behavior and acceptance of PWYW as well as the effect of its application on the seller's performance To the best of our knowledge, no previous research has studied PWYW

The goal of this study is to explain buyers' pricing behavior in PWYW and to analyze the impact of PWYW on sellers' revenues and unit sales We structure the remainder of the article as follows In the next section, we outline the functionality and classification of PWYW and summarize previous research on participative pricing mechanisms to draw important insights into and conclusions from similar pricing mechanisms, such as NYOP and auctions From related literature, we discuss the motives underlying payment and derive hypotheses for buyer behavior in PWYW This discussion leads us to our proposed model, which we test empirically with data from three field studies The three studies test our model of buyer behavior for different products in service industries a restaurant lunch buffet, movie screenings in a cinema, and hot beverages at a deli We also analyze the effects of PWYW on sellers' revenues, comparing prices and sales obtained under PWYW conditions with baseline sales at posted prices Finally, we discuss the implications of our findings

PWYW

Definition and Classification

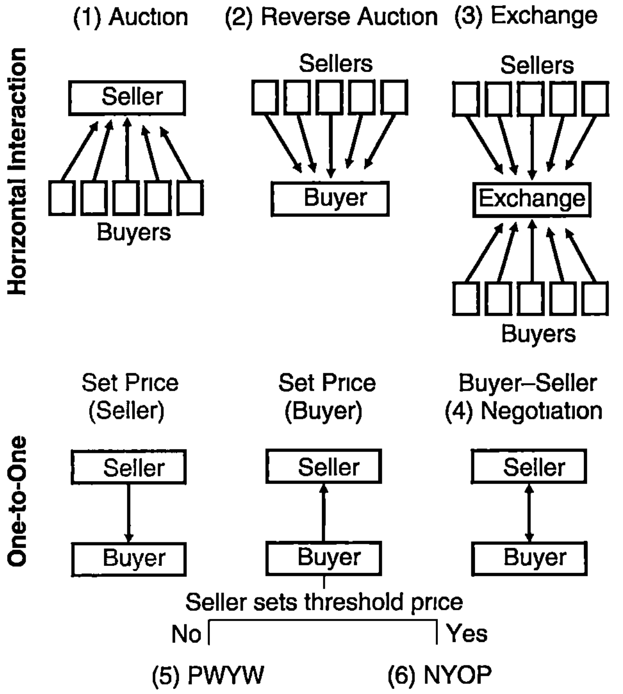
We define PWYW as a participative pricing mechanism that delegates the whole price determination to the buyer The seller simply offers one or more products under PWYW conditions, whereas the buyer decides on the price After the buyer has set the price, the transaction automatically proceeds Thus, the seller must accept the buyer's price and cannot withdraw the product offer

Pay what you want is classified as a participative pricing mechanism characterized by buyers' participation in the price determination Our classification (see Figure 1) of alternative participative pricing mechanisms builds on the market-making mechanisms of Dolan and Moon (2000) We distinguish different participative pricing mechanisms in Figure 1 according to the type of interaction one seller and one buyer ("one-to-one") or several buyers and/or several sellers ("horizontal interaction") We include the nonparticipative posted price ("set price") set by a seller as a reference

The most prominent examples of participative pricing mechanisms with horizontal interaction are (1) classic auctions, in which multiple buyers compete with their (increasing) bids to buy a product from a seller, (2) reverse auctions, in which multiple sellers compete with their (decreasing) bids to sell a product to a buyer, and (3) exchanges, in which multiple sellers and buyers compete on both sides of the market Participative pricing mechanisms characterized by the interaction between one seller and one buyer are (4) negotiations, in which the buyer and seller haggle over the price for the product, and (5) PWYW and (6) NYOP, which are both characterized by the buyer setting the final price However, the most important difference between PWYW and NYOP is that in NYOP, the seller can reject a buyer's bid if it is below an undisclosed threshold price set by the seller in advance

Therefore, NYOP sellers can influence the final price by setting this (minimum) threshold price, thus protecting themselves from having to accept bids that are too low Cur-

FIGURE 1
Classification of Participative Pricing Mechanisms



rent examples of sellers using NYOP are priceline.com, which specializes in selling flights, rental cars, hotel accommodation, vacations, and cruises; eBay, with its "Best Offer" feature; discount airlines, such as LTU.com and Germanwings.com; and the software seller ashampoo.com. Because priceline.com combines the NYOP mechanism with opaque products such that the actual seller (airline) will be revealed to buyers only after the purchase, it adds horizontal interaction among sellers to its mechanism.

In contrast to NYOP, no minimum threshold price exists in PWYW that could protect the seller against low prices. The seller must accept any price set by the buyer, including a price of zero. Pay what you want does not entail competition among the buyers, unless the seller offers a product of limited availability. In that case, consumers who buy first are served first.

Previous Research on Participative Pricing

Research on participative pricing mechanisms, such as NYOP, auctions, and price negotiations, has recently gained popularity (Chernev 2003; Ding et al. 2005; Kamins, Dreze, and Folkes 2004; Spann and Tellis 2006), though the literature on NYOP is still limited. Participative pricing has become more popular because the Internet provides a direct link to consumers and has made it easier for firms to implement pricing mechanisms, such as auctions and NYOP (Kannan and Kopalle 2001). In what follows, we limit our discussion to a brief summary of some key findings in this area. Although auctions and NYOP are mostly implemented by online retailers, the following findings on participative pricing mechanisms refer to both online and offline applications.

Participative pricing mechanisms allow for (individually) differentiated prices as an outcome of the interaction, which accounts for heterogeneous valuations of consumers and, thus, increased efficiency (Spann and Tellis 2006). In addition, the seller can serve buyers who would otherwise be priced out of the market (Bakos 1998). This also implies a benefit to the buyer arising from the pricing mechanism. Sellers can attract new customers' attention as a result of the mechanism's high level of innovativeness by permitting the consumers to participate in the price-setting process. Chandran and Morwitz (2005) show that consumers prefer to participate actively in setting the final price rather than to accept posted prices. Moreover, their results indicate that a higher perceived control on behalf of the buyers led to a greater intent to purchase. Consumers have greater fairness perceptions and satisfaction when they play a role in the price-setting process than when the retailer sets the prices (Haws and Bearden 2006). Haws and Bearden (2006) find that prices set through bidding were perceived as fairer than posted prices, even when the participants paid prices that were (equal to or) higher than their reference price. Finally, participative pricing mechanisms can provide useful information about consumers, such as their willingness to pay (Spann, Skiera, and Schaefers 2004). For example, power sellers on eBay, who repeatedly sell similar products in auctions, can use the individual prices paid for sales forecasts. Pay-what-you-want sellers can also use the individual prices for internal forecasting and for adapting the cost structure to the actual prices paid.

Buyer Behavior at PWYW

In a PWYW setting, consumers can determine any price for the product they buy. Theoretically, the range of possible prices is unlimited starting from zero because no threshold price exists. An economically rational customer, who maximizes his or her single purchase utility, may exploit the mechanism to pay a price of zero, but we observe from successful implementations of PWYW, in both online and offline applications, that this is predominantly not the case. As an example of typical behavior, according to the owner of the restaurant Wiener Deewan, which offers meals under PWYW conditions, prices paid range from €0 to €20, with a mean price of €7.49. Consumers' motives differ from the assumption in neoclassical economic theory that consumers purely maximize their utility. Thus, other factors must play a role when the PWYW price is determined. Subsequently, we first discuss motives as to why we expect consumers to pay positive prices at PWYW, and then we develop a model to explain prices paid to PWYW sellers.

Motives Underlying Payment

Drawing on Fiske's (1992) theory of social relationships, Heyman and Ariely (2004) define two general categories to describe exchange relationships: money-market relationships and social-market relationships. In money-market relationships, exchange between at least two parties is regulated by the use of a value or utility metric (e.g., the price for a product). In contrast, social-market relationships are characterized by nonpayment, and exchange partners act according to social exchange norms (i.e., norms of reciprocity, norms of cooperation, or norms of distribution), whereas money-market relationships invoke market exchange norms (Shampanier, Mazar, and Ariely 2007). Pay what you want dissolves the usual money-market relationship between seller and buyer by leaving the complete price determination to the buyer. Because a buyer can pay any price, including zero, the relationship is governed less by market exchange norms than by social exchange norms, which in turn influence the buyer's behavior (Osterhus 1997). This involves norms of distribution, which imply that people seek an equal allocation of resources and which are particular strong in democratic societies (Elster 1989). Violating these social exchange norms—in the case of PWYW, by paying nothing at all—may result in distress and social disapproval by other people (Ariely, Bracha, and Meier 2007; Elster 1989; Venkatesan 1966). Therefore, the benefit of nonpayment must be greater than the anticipated distress and fear of disapproval associated with the violation of social norms. Relatedly, Kahneman, Knetsch, and Thaler (1986) find that people are more willing to incur a loss than to accept an unequal distribution. Lynn (1990) provides an additional explanation for why consumers may pay more than zero. He finds that customers of a restaurant chose to pay more than they needed to for entreés they had already consumed. Lynn concludes that some people might use the price as an impression management tool to avoid appearing poor or cheap.

Because our empirical study is embedded in a democratic society, we expect that most consumers will conform to social norms and may not want to appear cheap in face-to-face interactions. Thus:

> H_1: Prices paid at PWYW in face-to-face interactions are greater than zero.

Model of Prices Paid

Our model of prices p_{ij}^{PWYW} paid at PWYW consists of two principal components, buyers' reference price, RP_{ij}, for the product (the amount of money they think it normally costs) and the proportion, a_{ij}, of consumer i's RP_{ij} that he or she is willing to discharge to the seller for a specific product j. Thus, the remaining $(1 - a_{ij})$ proportion of RP_{ij} is the customer's deal profit. Equation 1 states our basic model:

$$(1) \qquad p_{ij}^{PWYW} = a_{ij} \times RP_{ij} \qquad a_{ij} \geq 0.$$

Neoclassical economic theory would suggest that consumers pursue a strategy to maximize their utility, resulting in $a_{ij} = 0$. Mostly, however, we can observe successful applications of PWYW, in which buyers pay positive prices, that is, $a_{ij} > 0$. This leads to a question about the relevant factors that motivate buyers to discharge part of their reference price to the seller, thus reducing their deal profit. In the following, we derive hypotheses pertaining to the determinants of the final price paid. Therefore, we differentiate between drivers affecting a_{ij} and the consumer's reference price.

Drivers of the Proportion of a Buyer's Reference Price Discharged to the Seller

Recently, several studies in experimental economics have provided evidence that consumers are strongly motivated by concerns of fairness and reciprocity (Andreoni and Miller 2002, Bolton and Ockenfels 2000, Fehr and Schmidt 1999, 2003, Rabin 1993). Rabin (1993) developed the concept of the fairness equilibrium, which is based on the assumption that people help those who are kind to them and punish those who are unkind. Microeconomic experiments, such as the "ultimatum game" (Bolton 1991, Fehr and Schmidt 2003, Henrich 2000, Roth 1995), also weaken the hypothesis that consumers mostly act in a selfish and rational manner. Instead, the results indicate that many consumers are willing to cooperate and that their behavior is strongly driven by fairness concerns. In the ultimatum game, two participants (consumers) interact in the allocation of an endowment. The proposer determines the allocation of the endowment, such as a fixed sum of money between him- or herself and the responder. The responder can either accept or reject the proposal. If the responder decides to reject, neither of them receives anything. Neoclassical economic theory, which assumes that people maximize utility, would suggest that the proposer offers the responder the smallest amount possible and that the responder always accepts because even a small amount of money is better than no money at all. However, empirical results show that a 50 50 split is common and that responders often reject proposals of less than 20%. This behavior is explained by individual preferences for a balance of equity and a fair split (Roth 1995). The practice of voluntary contributions and tipping also provides empirical evidence that consumers pay for a service even if they do not need to do so. According to equity theory, fairness in social exchange implies a proportional allocation of resources (Adams 1965, Carrell and Dittrich 1978). Equity theory acknowledges that subtle and variable individual factors affect each consumer's assessment and perception of his or her relationship with relational partners (Guerrero, Andersen, and Afifi 2007). If a consumer perceives the ratio of his or her inputs to outcomes as equivalent to that of his or her relational partner, the consumer will consider that he or she has been treated fairly. Conversely, when a consumer participates in inequitable relationships, he or she will become distressed. In return for the received product or service, we expect that the buyer will reward the seller in appropriate monetary units to keep the balance of fairness. If a buyer chooses a high deal profit (low a_{ij}), he or she will need to anticipate the distress of the incurred inequity. Thus:

> H_2: Fairness has a positive influence on the proportion (i.e., a_{ij}) of a buyer's reference price discharged to the seller.

Beyond the concern of fairness, we believe that buyers also pay higher prices because of altruism (Maner and Gailliot 2007, Piliavin and Charng 1990), defined as a "behavior carried out to benefit another without anticipation of rewards from external sources" (Macaulay and Berkowitz 1970, p. 3). The existence of such pure altruism—that is, when a person does not care for any reward per se (Andreoni 1990)—is evident when people donate to children's villages or AIDS funds or when they tip waiters for bad service. Experimental results, derived from the "dictator game," also emphasize the importance of altruism to explain economic behavior (Andreoni and Miller 2002, Bolton, Katok, and Zwick 1998, Forsythe et al. 1994). In the dictator game, the proposer determines a split of money between him- or herself and the responder. In contrast to the ultimatum game, however, the responder has no option to reject the offer and must accept any proposal. The responder's role is entirely passive. Several researchers have shown that, on average, proposers allocate money to the responders and thus reduce their deal profit, which implies pure altruistic behavior. On the basis that consumers donate or allocate money to others without expecting a reward, we can conclude that pure altruistic behavior actually exists. Therefore, we assume that buyers with altruistic characteristics set a higher a_{ij}.

> H_3: Altruism has a positive influence on the proportion (i.e., a_{ij}) of a buyer's reference price discharged to the seller.

Previous literature has distinguished two types of satisfaction transaction-specific and cumulative satisfaction. Transaction-specific satisfaction refers to consumers' postchoice evaluations of a particular product transaction or service encounter (Jones and Suh 2000, Olsen and Johnson 2003). In contrast, cumulative consumer satisfaction is an overall evaluation of a product or service based on the consumer's total purchase and consumption experience to date (Anderson, Fornell, and Mazvancheryl 2004; Fornell 1992). In our study, satisfaction refers to the consumer's postconsumption evaluation of the perceived quality and/or service. If the seller offers a product with high quality, consumers' satisfaction and utility increase (Anderson, Fornell, and Lehmann 1994; Anderson and Sullivan 1993; Bolton 1998; Fornell 1992; Fornell et al. 1996). Therefore, satisfaction may lead to a higher a_{ij}.

> H_4: Satisfaction has a positive influence on the proportion (i.e., a_{ij}) of a buyer's reference price discharged to the seller.

Repeated purchases at the same store or a long-term relationship with the seller may also have an impact on the buyer's decision making. The purpose of a repeated purchase or, even stronger, the loyalty to a store may increase the price paid as a result of strategic behavior. Paying a price that does not even cover the expenses might harm the seller so much that the seller will not be able to survive. In the context of tipping, several researchers have examined the relationship of tip size and patronage frequency. Lynn and McCall (2000) and Conlin, Lynn, and O'Donoghue (2003) find a significant, positive correlation between these two variables. Bodvarsson and Gibson (1997) observe that, on average, regular buyers in seven restaurants tipped 1.05% more of the bill than others. Azar (2007) provides a possible explanation for such behavior. He assumes that customers fear uncomfortable feelings or embarrassment in the future when they tip less. Therefore, we expect that buyers pay higher prices because (1) they want the seller to survive and (2) they fear the feeling of embarrassment in the future when they pay a low price.

> H_5: Loyalty has a positive influence on the proportion (i.e., a_{ij}) of a buyer's reference price discharged to the seller.

In addition, price consciousness (when consumers focus exclusively on paying low prices) (Lichtenstein, Ridgway, and Netemeyer 1993) and income may affect the proportion of a consumer's reference price discharged to the seller. Price-conscious consumers are likely to shop for special offers and to react to price savings. From this behavior, we expect that buyers will try to enhance savings and increase their deal profit under PWYW conditions.

Both neoclassical economic theory and theories on fairness predict that consumers with a higher income contribute more to the public good, all things being equal (Borck, Frank, and Robledo 2006). Most empirical studies of voluntary contributions prove such a positive correlation. Many research articles (Hamilton, Sunding, and Zilberman 2003) also find evidence for a positive income effect on consumers' willingness to pay. Thus, we control for price consciousness and income in our analyses.

The Buyer's Internal Reference Price

In the marketing literature, reference prices are considered to have a strong impact on consumer behavior (Mayhew and Winer 1992; Rajendran and Tellis 1994). Empirical studies on consumers' price evaluations have shown that consumers use past prices to create a reference level that affects their perceptions of current prices (Adaval and Monroe 2002; Della Bitta and Monroe 1974; Kalwani and Yim 1992; Lattin and Bucklin 1989; Winer 1986). These internal reference prices are created in different ways; consumers can derive them from the previous period's price (Winer 1989) or from a weighted or smoothed average of past prices (Greenleaf 1995; Kalyanaram and Little 1994). They have also been defined as the price of the last brand purchased (Hardie, Johnson, and Fader 1993; Kalwani et al. 1990).

For example, if consumers perceive a specific product as being on sale often, their internal reference price decreases, leading to a decreasing willingness to pay (Krishna 1991). This finding is related to the notion of constructed preferences; consumers are often uncertain about their valuation of a product and use cues to determine their willingness to pay (Bettman, Luce, and Payne 1998). Such cues can be consumers' internal reference price or an external reference price for the same or a competing product. We use the internal reference price in our model because external reference prices are often not available when products are offered under PWYW conditions. In addition, consumers form the internal reference price on the basis of externally provided prices, such as advertised prices (Grewal, Monroe, and Krishnan 1998). Another reason we include the internal rather than external reference price in our model is due to the pricing mechanism itself. Applying PWYW, sellers can benefit from (individually) differentiated prices. With a given external reference price, the seller will probably reduce high variances of prices paid. In our studies, we operationalize the reference price as the memorized price of past purchases of the same (or comparable) products or services.

Integration of the drivers that affect the proportion a_{ij} of customer i's RP_{ij} for product j he or she is willing to discharge to the seller into the model of Equation 1 yields the following estimation model to explain prices set by consumers under PWYW conditions:

$$(2)\quad p_{ij}^{PWYW} = \beta_0 + (\beta_1 \times Fair_{ij} + \beta_2 \times Altru_i + \beta_3 \times Satis_{ij} + \beta_4 \times Loy_{ij} + \beta_5 \times PriceConsc_i + \beta_6 \times Income_i) \times RP_{ij} + \varepsilon_{ij}.$$

Empirical Studies

To test our model (Equation 2), we conducted three field studies with products in service industries. Thus, we observed three different product categories: (1) a lunch buffet meal at a restaurant, (2) movie screenings at a cinema, and (3) hot beverages at a delicatessen. In addition, we analyzed the impact of PWYW on revenues and sales. First, we describe the experimental design of the different field studies. Second, we evaluate our proposed model for each field study. Third, we analyze the impact of the implementation of PWYW on the sellers' revenues and sales.

Study Design

Study 1. We conducted our first field experiment at a Persian restaurant in downtown Frankfurt (Germany) in

November and December 2007 For a period of two weeks, the seller offered the buffet lunch, which originally cost €7 99, under PWYW conditions This restaurant can be classified as a middle-priced restaurant, and it can accommodate approximately 60 guests The study lasted eight weeks, including three observation weeks before the two experimental weeks During that time, we collected daily sales data

The product appeared to be appropriate for this experiment because the buffet lunch has high fixed costs but low variable costs In addition, the opening of the restaurant took place only nine months earlier Thus, the implementation of PWYW as a short-term promotional tool appeared to be particularly useful to win new customers and to use the spare capacity of the restaurant The PWYW offer was advertised with flyers, which were distributed in different areas of the city center In addition, two posters on an A-board (which we used to advertise the buffet lunch and its price before our experiment) helped publicize the promotion

During the experiment, the regular price of the buffet lunch was removed The buffet was ordered by 253 customers during the two experimental weeks After asking for the bill, the restaurant guests received a receipt that contained only the prices for the drinks Then, the waiter asked the customers to pay what they wanted for the buffet During the two weeks, 172 restaurant guests were surveyed after they had paid for their lunch meal (for a 68% response rate) They were asked to declare the explicit price paid for the buffet lunch per person (i e , the price paid for one buffet without tips and drinks) To test our model of buyer behavior in PWYW, the surveyed guests were asked a series of questions to measure their evaluation of fairness, altruism, loyalty, price consciousness, and satisfaction We measured responses to all questions on a five-point Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (5) A further question referred to customers' internal reference price We operationalized the internal reference price as the memorized price of the past purchases of the same (or comparable) products or services The constructs measured by this series of questions and their Cronbach's coefficient alphas of reliability appear in Table 1 These questions have been used previously in other studies and have high reliability In addition, customers were asked to estimate the seller's cost for one additional product or customer and to state a fair price for the product they had consumed

Study 2 The second field experiment took place in a multiplex cinema in a medium-sized town near the Frankfurt metropolitan area in November 2007 For three days (Monday–Wednesday), the management decided to offer the cinema tickets, usually ranging from €4 00 to €9 50, under PWYW conditions A regular price of €4 00 or €4 50 was charged only on the cinema's discount day, which is Tuesday The multiplex cinema consists of eight different movie theaters that provide seats for 99 to 355 guests, with a maximum total capacity of 1428 guests The experimental study lasted three days For calculation of baseline sales, management provided 53 weeks of daily data

Movie screenings at a cinema appeared to be an appropriate product for an application of PWYW because movie theaters are capacity-constrained services In the past few years, the capacity of the motion picture industry has not been fully used According to an interview with Stefan Arndt, chief of the German movie academy, consumers perceive an increase in prices, though the prices of cinema tickets have risen only marginally According to recent consumer surveys, current prices of cinema tickets are perceived as unfair Thus, PWYW appeared to be a good alternative to other price promotions, such as a discount day, because the consumers can self-determine the prices—in other words, have full control over the price—PWYW is expected to be a preferable pricing mechanism At the same time, we were curious as to whether PWYW would generate higher prices per customer than the discount day

Unlike Study 1, the price experiment was not advertised Only posters, which described the functioning of PWYW, were hung up inside the movie theater As usual, buyers were asked to pay before seeing the movie At the ticket office, the cashier asked people to pay what they wanted for the respective movies In contrast with the previous study, regular prices were not hidden but were accessible on each price list attached next to the ticket boxes After the customers named the price, the transaction took place, and they were handed a questionnaire Note that prices paid per person were collected and 247 ticket buyers participated in the survey (for a 64% response rate), which contained the same items as in Study 1 Buyers were asked to state the prices paid for the specific product separately, subtracting any tips or other purchases, such as gift vouchers In contrast to Study 1, we asked respondents to answer how satisfied they were with the cinema itself (e g , friendliness of cashiers, atmosphere, cleanliness of cinema) instead of asking them questions about the specific product to be consumed (i e , the movie) This was necessary because the buyers paid before watching the movie

Study 3 We conducted the third field experiment at a delicatessen located close to the main shopping street of a medium-sized city, Wiesbaden, which is part of the Frankfurt metropolitan area, in June and July of 2006 The delicatessen's stock includes various products, such as wine, chocolate, antipasti, sandwiches, and beverages (hot and cold) The shop also has seats for approximately 15–20 customers to eat inside

Our study lasted for six weeks, with observation periods two weeks before and after the two experimental weeks During the first experimental week, regular prices of all products were hidden, whereas external reference prices of some of the observed products (five of the ten products randomly chosen) were provided in the second experimental week We wanted to test whether the existence of external reference prices would affect the final price paid

A poster in the shop window, an A-board outside the shop, and flyers on the tables indicated that there was a special promotion in which the customers could pay whatever they wanted for the hot beverages During the experimental weeks, 813 hot beverages (e g , coffee, tea, hot chocolate) were sold under PWYW conditions We limited the experi-

TABLE 1
Overview of Items and Constructs Measured

Construct	Items	Relevant Literature for Scale Items	Cronbach's Alpha		
			Study 1	Study 2	Study 3
Fairness	•My price paid was fair toward the seller	Bolton, Warlop, and Alba (2003), Campbell (2007)	—	—	—
Altruism	•I love to help others •I have a good word for everyone •I am concerned about others •I make people feel welcome •I anticipate the needs of others	International personality item pool	849	837	870
Loyalty	•I'm a regular customer •I say positive things about this store to others •I encourage friends and relatives to shop at this store •I make an effort to use this store for covering a large part of my shopping	Bettencourt (1997)	749	822	810
Price consciousness	•Before I buy a product, I often check the prices of different retailers to obtain the best benefit •I usually purchase items on sale only •I usually purchase the cheapest item	Donthu and Gilliland (1996)	730	684	479
Income	•Please state your monthly net income	Coleman (1983)	—	—	—
Satisfaction	•I'm satisfied with the buffet/cinema/hot beverage •I liked the ambience •The waiter/waitress/cashier was friendly •The waiter/waitress/cashier was attentive •Customers are treated well in this store [a] •Employees of this store are not too busy to respond to customers' requests promptly [a]	Baker, Grewal, and Parasuraman (1994)	809	748	845
Reference price	•What did you pay for the same or similar product on your last shopping trip?	Bearden et al (1992)	—	—	—

[a] Not applicable at cinema (Field Study 2)

ment to the products that could be consumed at the delicatessen, we excluded beverages that were offered to go We analyzed a total of ten products [2] The regular unit prices of these products were hidden from buyers by removing the price board and pasting over the prices in the list of beverages After consuming the products, specifically at the time of payment, buyers were asked by the waiter to determine the price of the PWYW product As in the previous studies, they were asked to deduct potential tips and prices of products consumed contemporaneously from the price paid In addition, a random sample of 271 delicatessen guests was surveyed after they consumed and paid for the analyzed products (for a 33% response rate), which contained the same items as in Study 1

We chose beverages as experimental products because variable costs were low, narrowing the risk for the seller Thus, the seller could still achieve a positive profit margin even if the buyer's proportion of his or her reference price discharged to the seller was low

Results

Distribution of prices paid Table 2 summarizes descriptive statistics from the three experiments, including all collected data (i e , survey data of prices paid plus the price information from customers who did not fill out the questionnaire) Table 2 also shows regular unit prices and unit sales Consistent with H_1, prices paid were significantly different from zero ($p <$ 01) in all three studies However, we

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[2] The ten products were regular coffee, tea, cappuccino, latte macchiato, caffe latte, espresso, espresso doppio, espresso macchiato, iced coffee, and hot chocolate

TABLE 2
Price, Unit Sales, and Revenues

	Study 1	Study 2 (Cinema Ticket)		Study 3
Products	**Buffet Lunch**	**Regular Ticket**	**Discount Day Ticket**	**Hot Beverages**
ø Price PWYW in €[a]	6.44**	4.87**	3.11**	1.94**
ø Regular unit price in €	7.99	6.81	4.43	1.75
% Price increase[b]	–19.37**	–28.49**	–29.80**	10.62**
Number of units sold PWYW	253.00	273.00	113.00	813.00
Number of units sold regular	157.00	394.00	139.00	872.00
% Sales volume increase[b]	61.14**	–30.67 (n.s.)	–18.71 (n.s.)	–6.74 (n.s.)
Revenues PWYW in €	1660.26	1329.97	351.89	1577.14
Revenues regular in €	1254.43	2681.74	615.68	1529.20
% Sales value increase[b]	32.35*	–50.41 (n.s.)	–42.85 (n.s.)	3.14 (n.s.)

*$p < .05$
**$p < .01$
[a] Test of deviation of prices paid from zero (one sample t-test).
[b] Test of different means PWYW and regular (independent sample t-test).
Notes: n.s. = not significant.

were surprised to find that average PWYW prices paid in Study 3 were significantly higher ($p < .01$) than average regular prices. Overall, customers paid 10.62% ($p < .01$) higher prices for hot beverages, 28.72% less ($p < .01$) for the cinema tickets, and 19.37% less ($p < .01$) for the restaurant buffet lunch compared with regular prices.

The survey data indicate that, on average, consumers paid approximately 86% of their RP_{ij} to the sellers (i.e., a_{ij} is on average .86). A one-way analysis of variance reveals that the average values of the proportion a_{ij} of how much the consumer is willing to discharge of his or her RP_{ij} to the seller differ significantly ($p < .01$) across the three studies, whereas the average a_{ij} is highest for hot beverages (M = 1.01, SD = .34) and lowest for the cinema (M = .66, SD = .30). At the restaurant, the guests paid an average of 82% of their RP_{ij} for the lunch buffet, with a_{ij} ranging from .07 to 1.67 (SD = .26). The distribution of prices paid shows that only a few customers paid very low prices and that none decided to pay zero in the three studies (see Figure 2).

Estimation of model for prices paid. In total, we collected 690 questionnaires during the experimental treatment periods. After elimination of observations with missing price information, 167 observations remained from the restaurant, 171 remained from the cinema, and 270 remained from the delicatessen.

We averaged responses to multiple-item scales for all constructs in all our studies. These constructs have been previously used in other studies and show high reliability. The constructs and their Cronbach's alpha levels appear in Table 1. The results indicate that the reliabilities of the constructs are high. Cronbach's alpha for price consciousness is satisfactory for Study 1, but it falls below the cutoff criterion of .70 (Nunnally 1978) in Studies 2 and 3.

According to our estimation model (Equation 2), we account for comparability across products by multiplying each driver of a_{ij} by the internal reference price RP_{ij}. The internal reference prices counterbalance different levels of prices paid due to category disparities. Table 3 depicts the results of our model estimation over all field studies and separately for each study.

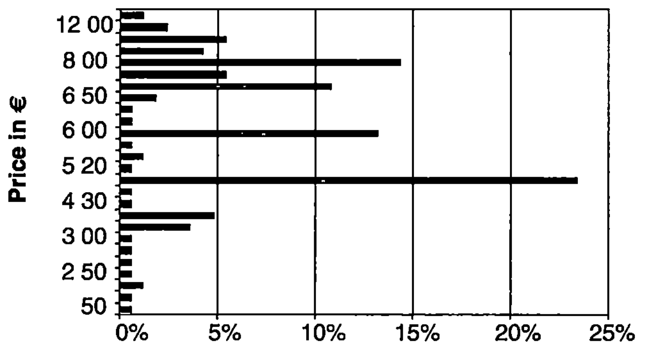
We estimated the parameters of our proposed model using ordinary least squares estimation. Testing the assumptions of the linear regression, we can justify the use of this model. For all our estimations, the condition index is below the cutoff criterion of 30, indicating that multicollinearity is not a problem. The assumptions of linearity, homoskedasticity, independence of errors, and normality of the error distribution are met. The value of R-square indicates that our proposed model explains 62% of the variation of buyer behavior across all field studies and 15%–30% in the separate estimations. In the following, we first discuss the results for our overall model and then provide a more detailed examination of the estimation results of each study separately.

As Table 3 shows, fairness positively affects the final price paid p_{ij}^{PWYW}. This finding is in line with H_2, people who reported having paid a fair price offered higher prices to the seller. However, H_3 is not supported, because the influence of altruism is not significant. Overall, altruism does not seem to play a considerable role when prices are determined within the PWYW context. Consistent with H_4, satisfaction significantly increases the price that the buyer is willing to pay to the seller. The more satisfied the buyer, the more of the deal profit he or she is willing to give up in favor of the seller. The effect of loyalty is not significant, thus yielding no support for H_5. We discuss this result in more detail when we analyze the studies separately. Consistent with our expectations, both control variables—price consciousness and income—significantly affect prices paid.

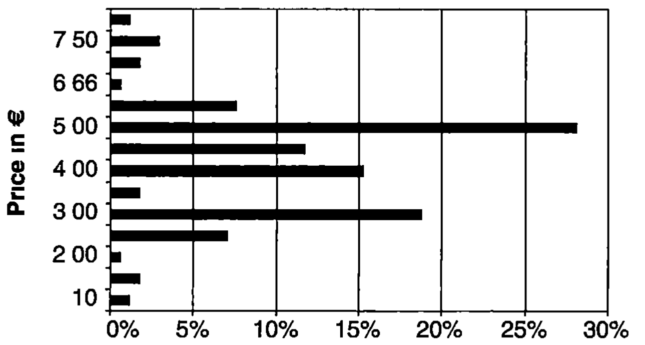
Overall, fairness has a significant impact on prices paid, but this result does not hold for the separate studies, as Table 3 suggests. The guests of the restaurant did not pay a higher price to the seller because of concerns for fairness or altruism. Instead, prices paid were solely driven by the buyer's level of loyalty, price consciousness, and income. In contrast to the results from the overall estimation, loyalty is a significant driver of prices paid for the lunch buffet. This might be due to the setting, the face-to-face interaction between customer and waiter is much more distinctive than in the other studies. Furthermore, approximately 70% of the

FIGURE 2
Distribution of Prices Paid in Percentage

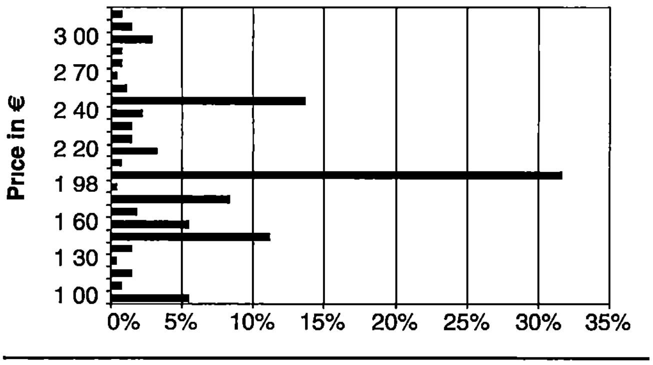
A: Study 1: Restaurant Buffet Lunch (ø regular unit price: €7.99)



B: Study 2: Cinema Tickets (ø regular unit price: €6.81; ø regular unit price at discount day: €4.43)



C· Study 3: Hot Beverages (ø regular unit price: €1.75)



surveyed guests expressed a strong desire (scale points 4 and 5) to come again The fear of embarrassment in the future could have been exceptionally high at the restaurant At first glance, it is rather striking that satisfaction has no significant effect on prices paid at the restaurant Research on tipping behavior also reports controversial findings when analyzing the correlation of tip size and service quality For example, Lynn and Simons (2000) find a positive correlation between service quality and tip size in the evening but not at lunchtime Our results from the restaurant (buffet lunch) support the finding that a higher price paid is not associated with higher service or product quality Examining the distribution of the responses regarding satisfaction, we observe that most of the respondents admitted to having a medium to high satisfaction with the service Only a marginal percentage of surveyed buyers (Study 1 4 8%, Study 2 8 8%, Study 3 2 9%) were displeased with either the product or the service

Analyzing the estimation results of the potential determinants of prices paid for cinema tickets, we show in Table 3 that the results differ from what we discussed previously At the cinema, fairness seems to be an important factor when determining the prices The level of fairness significantly and positively influences prices paid Although the consumers paid only 66% of their reference price to the seller, they believed that they had behaved fairly, the survey data show that approximately 90% of the consumers considered a price ≤€6 fair Similar to the results from the overall model, altruism does not significantly influence prices paid The reasons can be twofold First, the survey data indicate that only a marginal proportion (8 2%) of surveyed buyers evaluated themselves as selfish (averaged construct rating <3) Perhaps buyers were ashamed to admit that they were selfish rather than altruistic Second, as we already mentioned, in general, moviegoers perceive a recent increase in ticket prices and even evaluate them as unfair In addition, we believe that altruism does not play a role when consumers pay a large theater chain rather than small businesses that need to get paid adequately to survive Satisfaction with the cinema itself and the friendliness of the cashiers positively affect the prices paid and support H_4 Neither control variable (i e , price consciousness and income) has a significant effect on prices paid by consumers

At the delicatessen, we find a significant impact of altruism This finding corresponds to our expectation in H_3 but is not generalizable, because the effect is not significant in our overall model Especially at the delicatessen, face-to-face interaction was particularly high The owner of the delicatessen used to chat with his guests, so almost every consumer knew who they were paying This might be an explanation of why altruism significantly influenced the final price In contrast, fairness is not a significant driver of a_{ij} Perhaps fairness does not play such a great role when consumers determine the price for convenience products, such as hot beverages In addition, satisfaction and loyalty do not influence prices paid A possible explanation for the lack of effect of satisfaction is that only a marginal percentage of surveyed buyers (2 9%) were displeased with either the product or the service In their empirical studies, Reinartz and Kumar (2002) show no existing correlation between loyalty and customers' willingness to pay more Instead, they provide evidence that particularly long-term customers believe that they deserved lower prices Finally, we find no significant relationship between price consciousness and prices paid for hot beverages This strengthens our assumption that some consumer characteristics, such as fairness and price consciousness, are not relevant when it comes to small convenience products The effect of income is significant

TABLE 3
Estimation Results

Variables[a]	Overall Studies		Study 1: Restaurant Buffet		Study 2: Cinema Ticket		Study 3: Hot Beverages	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept	808**	118	2 892**	676	2 982**	432	1 222**	161
Fairness	049**	011	031	020	046**	015	– 015	017
Altruism	016	015	020	027	– 037	021	062**	022
Satisfaction	073**	016	016	031	056**	021	014	026
Loyalty	018	014	072*	034	– 018	017	027	020
Price consciousness	– 032**	012	– 055*	024	– 014	015	– 029	018
Income	000**	000	000**	000	000	000	000**	000
R^2	619		299		163		154	
Adjusted R^2	615		271		132		133	
N	608		167		171		270	

*$p < 05$
**$p < 01$
[a]All variables (except the constant) are multiplied with the internal reference price RP_{ij}
Notes Dependent variable = price paid at PWYW

In Study 3, we experimentally provided external reference prices for the second week of the PWYW offering for five products (latte macchiato, espresso doppio, espresso macchiato, coffee, and tea) Therefore, we can test the robustness of our estimation results by including a dummy variable for observations from the second week with reference price information present We find that the existence of reference price information is significant (coefficient = 131, $p < 01$) without substantial changes to the parameter estimates of the other variables, as reported in Table 3 Higher prices were paid when the guests of the delicatessen consumed one of the five products whose reference prices were provided On average, guests provided with a reference price paid 104% (a_{ij} = 1 04) of the regular prices to the seller

According to our estimation results, we conclude that final prices paid are mainly driven by what consumers believe is fair, by their satisfaction with the product or service, by their price consciousness, and by their net income In addition, an external reference price provided by the seller can have a positive impact on final prices paid In contrast, altruism and loyalty only partially influence the product prices when consumers have the chance to pay whatever they want for them

Impact on revenues and unit sales To analyze the impact of the PWYW application on sellers' unit sales and revenues, we compared the revenues and sales during the experimental period with an appropriate baseline Baseline revenues are defined as the measure of average revenues per day derived from the preexperimental observation periods (at the restaurant 3 weeks of daily data, at the cinema 53 weeks of daily data, at the deli 2 weeks of daily data) Figure 3 illustrates the percentage deviation of revenues in the PWYW treatment periods to baseline revenues

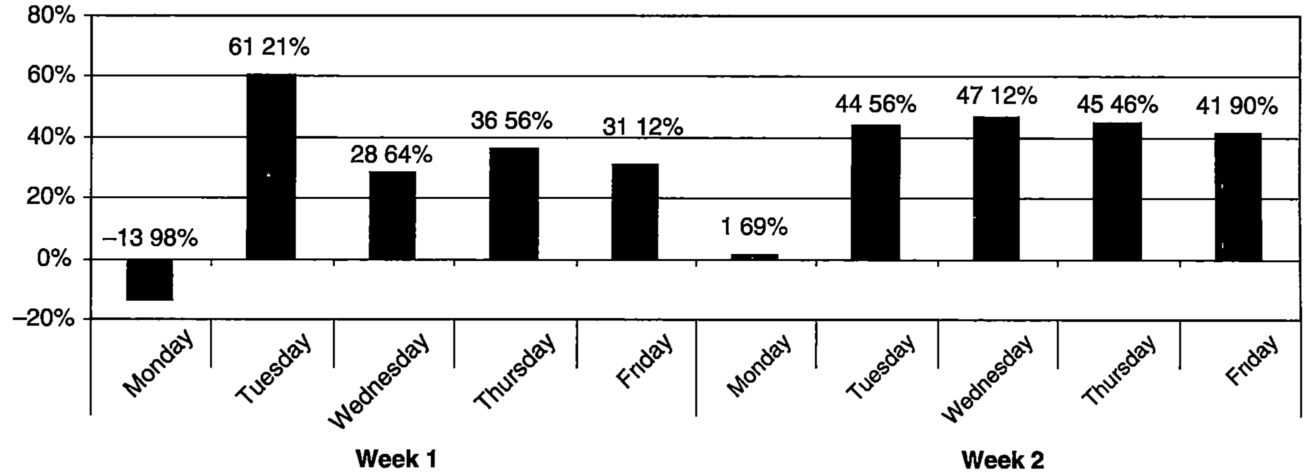
In Study 1, on average, revenues (sales value) rose significantly by 32 35% across the experimental days for the restaurant owner ($p < 05$, see Table 2) Except for one day, PWYW sales were higher than baseline sales, increasing by as much as 61 21% Although the average price paid was significantly lower than the regular price (€6 44 versus €7 99, $p < 01$), the seller could realize more revenue by increasing the number of unit sales (see Figure 3) Overall, we find an increase in unit sales of 61 14% ($p < 01$) The sales increase is mainly driven by new customers, compared with the average number of new customers at fixed prices (approximately 11 new customers per day), the number of new customers rose to approximately 17 per day for the restaurant Conducting an independent sample t-test, we find that the increase in the number of new customers is significant ($p < 01$) In addition, approximately 70% of new customers stated that they would most likely visit the restaurant again Most of the buyers (87 3%) also stated that their preference for PWYW over a fixed price was medium to high Thus, we can conclude that the use of PWYW was beneficial for the seller The seller decided to retain PWYW as a pricing mechanism for the buffet lunch

In Study 2, on average, customers paid 28 49% lower prices on regular days (not a discount day) compared with regular prices ($p < 01$) and 29 80% lower prices on the discount day ($p < 01$, see Table 2) As Figure 3 shows, revenues mostly decreased when PWYW was applied Except for two screenings, the revenues of the cinema suffered strongly both on a regular day and on the discount day (Tuesday) Because of only a few observations (i e , number of screenings), this finding is not significant However, in this case, PWYW does not seem to be a profitable pricing mechanism The large decrease in sales units compared with baseline sales cannot be explained by the application of PWYW, because it was not advertised and consumers became aware of it only after entering the cinema Therefore, we can explain this sales decrease only by chance

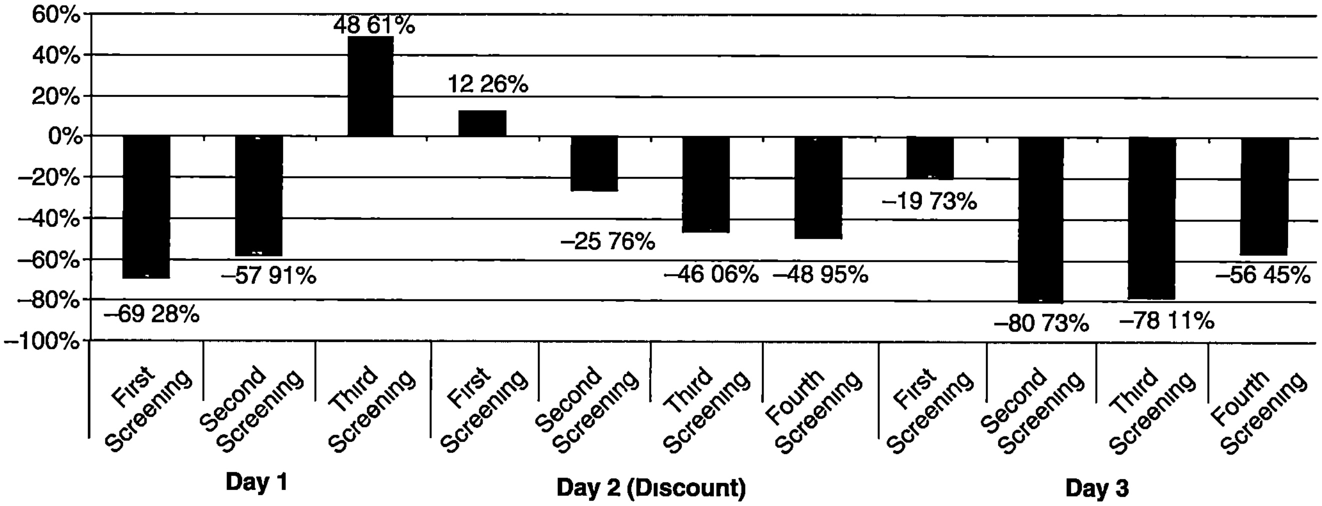
In Study 3, PWYW sales values were higher in 9 of the 12 days (the store was closed on Sunday) at the delicatessen On average, revenues across the experimental days were approximately 3 14% higher than baseline revenues (not significant) during the promotion period, though

FIGURE 3
Comparison of PWYW Revenues with Baseline

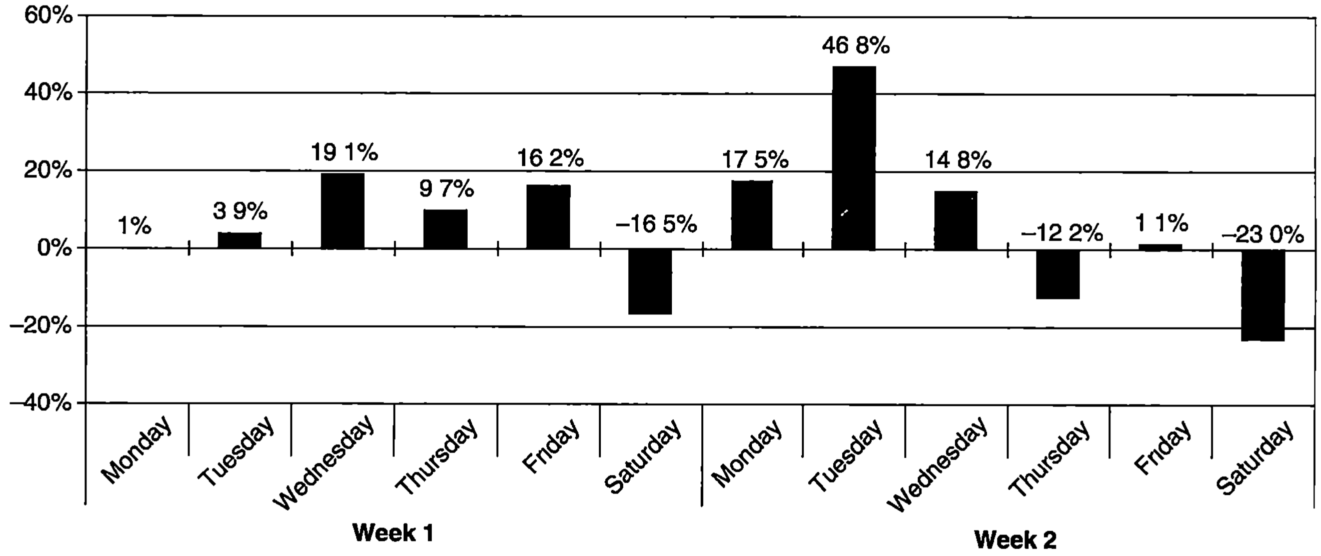
A: Study 1: Restaurant Buffet Lunch (relative deviation of PWYW revenues to baseline)



B: Study 2: Cinema Ticket (relative deviation of PWYW revenues to baseline)



C: Study 3: Hot Beverages (relative deviation of PWYW revenues to baseline)



the beverages were not sold more frequently (see Table 2) Except for one day, the average prices paid for all ten products were significantly higher (10 62%, $p < 01$) than the average of regular prices, explaining the increase in revenues Possible reasons PWYW did not lead to a significant rise in unit sales (but a decrease of 6 74%, not significant) could be because the delicatessen had existed for a few years and thus was already established and had a low level of vacant seats/capacity As the survey data reveal, 12 9% of new customers visited the deli because of the PWYW promotion Unfortunately, no historical data of new customers are available to analyze potential differences in the rate of new customers generated by the pricing mechanism Because the implementation of PWYW did not cause additional costs, however, the owner of the store inferred that PWYW had a positive effect on profits

Discussion

This article provides a first classification and analysis of the innovative pricing mechanism PWYW We discuss how PWYW, which is classified as a participative pricing mechanism similar to auctions and NYOP, can realize price differentiation and generate additional sales and revenues as well as useful information for the adoption of marketing instruments

We analyze buyer behavior and revenue effects of PWYW for different sellers Conducting three field studies, we experimentally test PWYW and find that consumers do not behave as rational as traditional economic theory suggests In contrast, our findings show that final prices paid are significantly ($p < 01$) greater than zero for all three cases, none of the buyers chose to pay a price of zero during the experimental period Our results also indicate that the final price paid depends on the buyer's internal reference price and the proportion of how much the buyer is willing to share of his or her (potential) deal profit with the seller We found that this proportion is mainly driven by the consumer's fairness, satisfaction, price consciousness, and income Contrary to our expectations, altruism and loyalty are insignificant factors in our overall model However, a more detailed examination of each study separately revealed that altruism and loyalty are not negligible influences Instead, loyalty is a significant driver of a_{ij} in Study 1 (lunch buffet), and altruism has a strong, significant impact on prices paid for hot beverages in Study 3

When examining the effects of PWYW on the sellers' revenues, we find that revenues in two of the three observed product categories were higher at PWYW prices than baseline revenues At the restaurant buffet lunch, the difference was significant After the success of the experimental weeks and after receiving positive feedback from his guests, the owner of the restaurant decided to keep the price format in the long run Seven months after introducing PWYW permanently for the buffet lunch, the owner still reports positive results and even plans to open up another restaurant with the same pricing mechanism The case of the restaurant illustrates the potential of PWYW as a marketing instrument for new businesses By implementing PWYW, the restaurant owner attracted more customers and increased revenues

It was surprising that average prices paid were higher than regular prices at the delicatessen These higher prices at PWYW imply an opportunity to raise product prices in the future Overall, the results of the experiments imply that PWYW might be suitable as a price promotion tool, even though it did not lead to a revenue increase for cinema tickets Our study showed that buyers had a high variance for the estimated variable costs of a ticket at the cinema This could explain why some buyers believe that ticket prices are unfair

In addition, PWYW may help improve a seller's credibility by letting the consumers decide the prices of products Some pricing policies, such as hi–lo pricing, are losing consumers' confidence in the retailer's credibility (Hoch, Dreze, and Purk 1994, Ortmeyer, Quelch, and Salmon 1991) With PWYW, the seller gives buyers the chance to self-determine the prices that may lead to an overall increase of perceived fairness (Haws and Bearden 2006) By implementing PWYW, the seller can demonstrate to consumers that he or she believes in the quality of the products because lower prices can compensate for inferior quality The application is also simple and easy to communicate to consumers It may also increase the chance of word of mouth and build up a positive pricing image among consumers

From the seller's point of view, however, PWYW poses a risk that the price paid by buyers will be much lower than the seller's cost, or even equal to zero Especially for high-priced products, PWYW does not seem to be an appropriate pricing mechanism, because the incentives to realize a large deal profit may outweigh aspects of fairness and loyalty In such a situation, revenues will probably suffer if the seller cannot set a minimum price threshold Furthermore, products with high fixed but low variable costs are more appropriate for the application of PWYW because low variable costs limit the risk of prices below costs for the seller In our field studies, a personal interaction between the seller and buyers existed, and we believe that such an interaction supports the applicability of PWYW However, the recent success of Radiohead's digital album sales indicates that PWYW may even be applied to the anonymous interactions on the Internet

Our study has several limitations According to the owner of the restaurant, revenues almost doubled in the evening (when he still charges posted prices) after we conducted the field experiment It seems clear that PWYW also had an impact on evening sales, but because of the owner's concerns that evening customers might be disturbed by another survey, we could not collect the data to analyze this effect A similar effect might have occurred at the delicatessen (e g , sandwich) and the cinema (e g , popcorn), where (promotion-triggered) customers might also have purchased other products Thus, the reported sales effects are a conservative estimation of the "benefits" of PWYW Our findings from the model estimation reveal that other factors, depending on the product category or specific setting, may have an impact on final prices paid Finally, hot beverages are convenience products for which consumers' involvement in determining the "right" price is probably not as high as when they determine the price for a lunch buffet.

We conducted three studies in different industries, but these were all part of the services sector. Although the services sector is already the dominant contributor to industrialized countries' gross domestic product, we cannot generalize our findings to other industries.

Because PWYW is a new pricing mechanism, several directions for further research can be identified. One important research aspect is the analysis and comparison of various designs of this pricing mechanism with respect to the objectives of the seller in experimental studies. Furthermore, the mental mechanisms underlying payment in PWYW could be delineated in laboratory studies. In addition, a more detailed analysis of consumers' preferences regarding different designs of PWYW or related participative pricing mechanisms, as well as the extent to which they may influence the consumers' decision processes, would be worth studying. Further research should also be conducted in the field of sales promotion activities for products (e.g., whether PWYW is an alternative to free samples). If buyers pay a price greater than zero, PWYW might be less costly than giving away free samples. Also of interest is whether a seller can achieve an effect such as a money-back guarantee when PWYW is implemented. Similar to the money-back guarantee, the buyer can compensate for lower perceived quality by reducing the price paid. Furthermore, the dynamic effects of PWYW on consumers (e.g., learning and long-term viability of the seller) represent a worthwhile avenue for further research. Another research aspect could be a test of suitable products or suitable categories for an application of PWYW to identify favorable product attributes (e.g., what product quality is necessary to be profitable with PWYW). The analysis of intercultural differences in buyer behavior is another promising extension. Cultural differences and the level of democracy in a society are likely to influence the proportion of the (potential) deal profit consumers discharge to the seller. Finally, an application of PWYW does not seem to be suitable for all distribution channels. A comparison of the suitability of different distribution channels is another aspect for further research.

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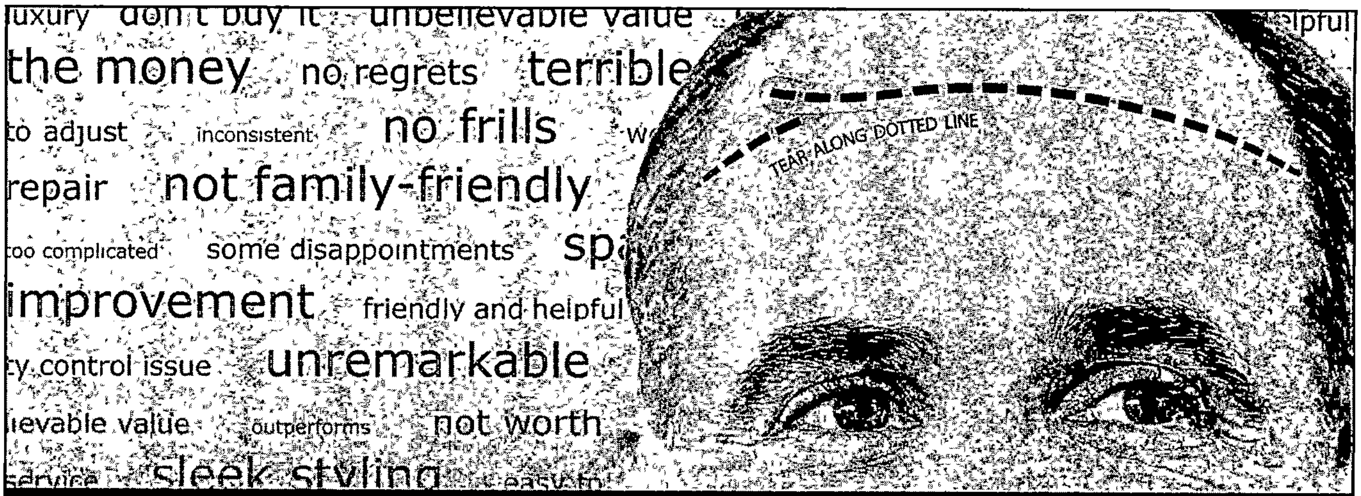

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Neil A. Morgan & Lopo L. Rego

Brand Portfolio Strategy and Firm Performance

Most large firms operating in consumer markets own and market more than one brand (i e , they have a brand portfolio) Although firms make corporate-level strategic decisions regarding their brand portfolio, little is known about whether and how a firm's brand portfolio strategy is linked to its business performance Using data from the American Customer Satisfaction Index and other secondary sources, the authors examine the impact of the scope, competition, and positioning characteristics of brand portfolios on the marketing and financial performance of 72 large publicly traded firms operating in consumer markets over ten years (from 1994 to 2003) Controlling for several industry and firm characteristics, the authors analyze the relationship between five specific brand portfolio characteristics (number of brands owned, number of segments in which they are marketed, degree to which the brands in the firm's portfolio compete with one another, and consumer perceptions of the quality and price of the brands in the firm's portfolio) and firms' marketing effectiveness (consumer loyalty and market share), marketing efficiency (ratio of advertising spending to sales and ratio of selling, general, and administrative expenses to sales), and financial performance (Tobin's q, cash flow, and cash flow variability) They find that each of these five brand portfolio characteristics explains significant variance in five or more of the seven aspects of firms' marketing and financial performance examined

Keywords brand management, strategic marketing, marketing planning, customer satisfaction, market share

Managers and scholars are increasingly focused on linking resources deployed in developing marketing assets with firms' financial performance (e g , Rust et al 2004) From this perspective, the marketing literature provides a well-developed theoretical rationale (e g , Keller 1993, Srivastava, Shervani, and Fahey 1998) and a growing body of empirical evidence (e g , Barth et al 1998, Madden, Fehle, and Fournier 2006, Rao, Agarwal, and Dahlhoff 2004) linking brands with competitive advantage for the firms that own them As a result, it is widely accepted that brands are important intangible assets that can significantly contribute to firm performance (e g , Ailawadi, Lehmann, and Neslin 2001, Capron and Hulland 1999, Sullivan 1998) However, in practice, most large firms operating in consumer markets own and market a set of different brands (i e , they have a brand portfolio) and make firm-level strategic decisions about this intangible brand portfolio asset (Aaker 2004, Dacin and Smith 1994, Laforet and Saunders 1999) Yet little is known about how a firm's brand portfolio strategy affects its business performance (Anand and Shachar 2004, Carlotti, Coe, and Perry 2004, Kumar 2003)

In the literature, logical but opposing arguments have been advanced regarding the performance benefits of several different brand portfolio strategy decisions For example, some researchers have suggested that portfolios comprising a larger number of brands can enable a firm to achieve greater power than channel members and can deter the entry of brands from rivals (e g , Bordley 2003, Shocker, Srivastava, and Ruekert 1994) Conversely, others have highlighted the greater manufacturing and distribution economies and relative advertising and administration efficiency of portfolios comprising a smaller number of brands (e g , Aaker and Joachimsthaler 2000, Bayus and Putsis 1999, Kumar 2003) Similarly, while some researchers have advocated the scale and scope economy benefits of selling brands across different market segments (e g , Lane and Jacobson 1995, Steenkamp, Batra, and Alden 2003), others have warned that doing so may dilute the value of a firm's brands (e g , John, Loken, and Joiner 1998, Morrin 1999) Furthermore, some researchers have argued that firms should build portfolios in which their brands are complementary to one another to allow for stronger positioning of each brand in the minds of consumers and greater advertising and administration efficiency (e g , Aaker and Joachimsthaler 2000, Bayus and Putsis 1999, Kumar 2003) However, others have argued that greater competition for the same consumers and channels among the brands in a firm's portfolio can deter the entry of rival firms and lead to greater efficiency in a firm's resource deployments (e g , Lancaster 1990, Shocker, Srivastava, and Ruekert 1994)

Such divergent and often conflicting viewpoints in the academic literature are also reflected in business practice, in which firms that have similar resources and operate in the same categories often make radically different brand portfolio strategy decisions For example, in the confectionary gum category, Wrigley markets a large number of different brands with multiple and often competing brands in each of the taste (Juicy Fruit, Wrigley's Spearmint, Doublemint,

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Extra), breath-freshening (Winterfresh, Big Red, Eclipse), oral care (Orbit, Freedent), and wellness (Alpine, Airwaves) segments Its major competitor, Cadbury, markets only four brands (Bubbas, Hollywood, Dentyne, and Trident), each of which is aimed at different segments Similarly, in the lodging industry, Ramada markets a single brand across multiple value and midmarket segments, while Marriot addresses the whole market, using a portfolio of ten major brands, several of which compete with one another (e g , in the suites segment, Residence Inn, Springhill Suites, and TownePlace Suites)

Remarkably, despite these opposing theoretical viewpoints in the literature and evident divergence in "theories in use" among firms, there is little or no empirical evidence to guide managers' brand portfolio strategy decisions (Hill, Ettenson, and Tyson 2005) Given the importance of brands to strategic marketing theory explanations of firm performance and the significant resources that firms expend on brand building, acquisition, and management, this is an important gap in marketing knowledge

We address this knowledge gap by empirically examining the relationship between the brand portfolio strategy characteristics of 72 large firms operating in consumer markets and their marketing and financial performance over the 1994–2003 period Collectively, these firms generate annual sales revenues of more than $1 trillion from marketing approximately 1300 brands across 16 industries We begin by examining the literature pertaining to important dimensions of firms' brand portfolio strategy, identifying the major theoretical arguments associated with each brand strategy dimension, and providing relevant examples of current business practice Next, we describe our research design in relation to the data set assembled and the analysis approach adopted We then present and discuss the results of our analyses Finally, we consider the theoretical and managerial implications of our results, note some limitations of our study, and highlight avenues for further research

Dimensions of Brand Portfolio Strategy

The literature indicates that three key aspects of a firm's brand portfolio strategy are (1) scope, which pertains to the number of brands the firm owns and markets and the number of market segments in which it competes with these brands, (2) competition, which pertains to the extent to which brands within the firm's portfolio compete with one another by being positioned similarly and appealing to the same consumers, and (3) positioning, which pertains to the quality and price perceptions of the firm's brands among consumers (e g , Aaker 2004, Chintagunta 1994, Porter 1980) Together, these three characteristics provide a rich picture of a firm's brand portfolio strategy For example, Gap Inc currently markets eight brands (Old Navy, Gap, BabyGap, GapBody, GapKids, Banana Republic, Piperlime, and Forth & Towne) across six North American Industry Classification System market segments in the retail apparel industry (men's clothing stores, women's clothing stores, family clothing stores, clothing accessories stores, shoe stores, and electronic shopping), has a relatively limited amount of competition between its brands (some competition between Old Navy and Gap, but little or no competition between the remaining brands), and maintains a medium quality–medium price overall positioning profile among consumers (lower price–lower quality positioning for Old Navy, medium price–medium quality for Gap, BabyGap, GapBody, GapKids, and Piperlime, and slightly higher price–higher quality for Banana Republic and Forth & Towne)

Next, we consider each of these dimensions of brand portfolio strategy in greater detail We discuss each dimension separately in accordance with the literature on which we draw Thus, most of the literature-based arguments have been framed in unidimensional ceteris paribus terms, even though brand portfolio strategy is widely viewed as a complex multidimensional phenomenon Because both the theoretical literature and "theories in use" evident in business practice offer support for opposing arguments for most of the key dimensions of brand portfolio strategy we identify, we elaborate on these arguments but do not offer formal hypotheses Rather, we adopt an exploratory approach and treat the performance outcomes associated with each brand portfolio strategy characteristic as an empirical question

Brand Portfolio Scope

Number of brands The literature indicates several benefits associated with brand portfolios that comprise a large rather than small number of brands In particular, it has been suggested that owning a larger number of brands enables a firm to attract and retain the best brand managers and enjoy synergies in the development and sharing of specialized brand management capabilities, such as brand equity tracking, market research, and media buying (e g , Aaker and Joachimsthaler 2000, Kapferer 1994), to build greater market share by better satisfying heterogeneous consumer needs (e g , Kekre and Srinivasan 1990, Lancaster 1990), to enjoy greater power than media owners and channel members (e g , Capron and Hulland 1999, Putsis 1997), and to deter new market entrants (e g , Bordley 2003, Lancaster 1990) Conversely, the literature also suggests that larger brand portfolios are inefficient because they lower manufacturing and distribution economies (e g , Finskud et al 1997, Hill, Ettinson, and Tyson 2005, Laforet and Saunders 1999) and dilute marketing expenditure (e g , Ehrenberg, Goodhardt, and Barwise 1990, Hill and Lederer 2001, Kumar 2003) In addition, brand proliferation has been identified as a potential cause of weakened brand loyalty and increased price competition across many markets (Bawa, Landwehr, and Krishna 1989, Quelch and Kenny 1994), suggesting more potential costs associated with larger brand portfolios

Mirroring these competing viewpoints in the literature, divergent brand portfolio strategies with respect to the number of brands owned by firms may also be observed in practice In consumer packaged goods over the past five years, for example, seeking to enhance its profitability, Unilever has implemented a strategy of pruning its brand portfolio from 1200 to 400, and H J Heinz has also embarked on a portfolio rationalization strategy During the same period, however, Nestlé has grown its brand portfolio aggressively through its acquisition of Ralston Purina, Chef America, Dreyer's, Gerber, and Novartis Medical Nutrition Similarly, increasing the number of brands in its portfolio to enhance the company's power relative to retailers and media owners has been proffered as the logic for Procter & Gamble's recent acquisition of Gillette

Number of market segments The number of different segments in which a firm markets its brands indicates the scope of its product-market coverage within an industry Studies of firm diversification suggest that strong marketing links, such as common brands, among the different segments in which a firm operates may deliver economies-of-scope benefits in the firm's expenditures to create and maintain its brand portfolio (e g , Grant and Jammine 1988, Palich, Cardinal, and Miller 2000) Conversely, the marketing literature indicates that extending a brand across multiple market segments can weaken the brand, depending on consumer perceptions of the "fit" among the different product-market segments (e g , Aaker and Keller 1990, Broniarczyk and Alba 1994) Therefore, in marketing its brands across multiple segments, a firm runs the risk that it will dilute their strength, making them less valuable (e g , John, Loken, and Joiner 1998, Morrin 1999) Because most large firms own multiple brands, to avoid this dilution risk, a firm may choose to market different brands in each market segment in which it operates However, the marketing literature suggests that lowering the risk of entering new markets is an important benefit of owning a brand that a firm can leverage (e g , Kapferer 1994) Therefore, failing to leverage a brand across more than one segment is likely to both raise the risks associated with a firm's decision to enter additional segments and limit the economies of scope available from a multisegment market coverage decision

Reflecting these different viewpoints in the literature, in practice, we also note diverse brand portfolio strategy decisions in terms of the number of segments in which firms market their brands For example, Sara Lee recently reduced the number of product-market segments in which it markets its food brands by disposing its coffee-related brands At the same time, however, J M Smucker has recently expanded the number of categories in which its existing brands compete and has entered several additional new segments through its recently acquired Jif, Crisco, and Pillsbury brands Similarly, in the apparel industry, Fruit of the Loom markets its brands to the midmarket adult and children's segment across a small number of product categories (underwear, T-shirts, sweatshirts), while VF Corporation markets its brands to a far greater number of consumer segments at different price points, selling a much wider range of products in the jeanswear, outdoorwear, sportswear, shoes, and intimate apparel categories

Intraportfolio Competition

The literature offers different viewpoints regarding the performance effects of intraportfolio competition (i e , the extent to which brands within the firm's portfolio are positioned similarly to one another and compete for the same consumers' spending) On the one hand, the literature suggests several performance downsides, including lower price premiums from channel members and consumers (e g , Aaker and Joachimsthaler 2000), lower "bang for the buck" in advertising expenditures as a result of demand cannibalization among the firm's brands (e g , Kapferer 1994, Park, Jaworski, and MacInnis 1986), and lower administrative efficiency as a result of duplication of effort (e g , Laforet and Saunders 1994) However, the literature also indicates several benefits from intraportfolio competition, including competition for channel resources and consumer spending creating an "internal market," leading to greater efficiency and better resource allocations (Low and Fullerton 1994, Shocker, Srivastava, and Ruekert 1994), creating a barrier to entry for potential rivals (e g , Scherer and Ross 1990, Schmalensee 1978), and mitigating the negative effects of variety-seeking consumers' brand-switching behavior on the firm's performance (e g , Feinberg, Kahn, and McAlister 1992)

In practice, there also appear to be different "theories in use" with regard to the costs and benefits of intraportfolio competition For example, Unilever, the second-largest player in the global home care category, markets two laundry detergent brands in the United States Wisk, targeted at performance-oriented consumers and positioned as the most efficacious laundry detergent, and All, positioned as a value brand and targeted at price-sensitive consumers Meanwhile, Procter & Gamble markets seven laundry detergent brands (Bold, Dreft, Era, Gain, Ivory Snow, Cheer, and Tide), some of which compete with one another for consumer spending and retail support Similarly, in the blended scotch whiskey and gin categories, the largest player, Diageo, markets multiple brands that appeal to similar consumers of blended scotch (e g , Bells, Black & White, Haig, J&B) and gin (Gordon's, Gilbey's, Tanqueray), while the second-largest supplier, Pernod Ricard, markets only two major blended scotch brands (Chivas Regal and Ballantine's), which are priced to appeal to different segments, and only one gin brand (Beefeater)

Brand Portfolio Positioning

Perceived quality Perceived quality pertains to the strength of positive quality associations for the brands in the firm's portfolio in the minds of consumers (e g , Gale 1992, Smith and Park 1992) Much of the value of a brand is related to its ability to reduce consumer risk, and brands that are perceived as high quality deliver greater consumer risk-reduction value (Aaker and Keller 1990, Smith and Park 1992) and superior financial returns to their owners (e g , Aaker and Jacobson 1994) High-quality brands also enjoy greater price premiums (e g , Sivakumar and Raj 1997), and the perceived quality of multiple products bearing the same brand name affects the overall value of the brand (e g , Randall, Ulrich, and Reibstein 1998) As a result, marketing actions, such as price promotions, provide greater returns for high-quality than low-quality brands (e g , Allenby and Rossi 1991, Blattberg and Wisniewski 1989, Kamakura and Russell 1989), and high-quality brands suffer less negative demand impact from price increases (Sivakumar and Raj 1997) and require less advertising expenditure and fewer price reductions (Agrawal 1996)

Perceived price Perceived price pertains to consumer perceptions of the price of the brands in the firm's portfolio (e g , Dacin and Smith 1994, Gale 1994) Consumer price perceptions are widely believed to be fundamental determinants of consumer brand choice and postpurchase attitudes and behavior (e g , Dodds, Monroe, and Grewal 1991, Zeithaml 1988) The extent to which consumers perceive the brands in the firm's portfolio as being lower in price, ceteris paribus, should result in greater customer satisfaction and loyalty (e g , Chaudhuri and Holbrook 2001, Gale 1994) and thus lead to enhanced sales and market share, which in turn may lead to economies of scale and superior financial performance (e g , Aaker 1991, Woodruff 1997)

Therefore, the literature suggests the potential performance benefits of achieving a brand portfolio positioning in which consumers perceive the firm's brands as being both high quality and low price, and there are examples of firms' brands that have achieved such a position (e g , Target, Southwest Airlines) However, achieving both positions simultaneously for all the brands in a firm's portfolio may also be difficult and relatively rare in practice For example, consumers often use price as a quality cue, making it difficult to achieve perceptions of both high quality and low price (e g , Kirmani and Rao 2000) In addition, achieving strong quality perceptions among consumers is often expensive because it may involve using higher-quality raw materials or better-trained service operatives, superior manufacturing or operations technologies, and greater marketing communication expenditures (e g , Rust, Zahorik, and Keiningham 1995) Such additional costs can make it difficult to sell the firm's brands at prices that consumers will perceive as low cost

These trade-offs are widely reflected in business practice, with many examples of firms in the same category adopting different brand strategy portfolio positions For example, in the wine and spirits category, LVMH markets a collection of high-quality, high-price brands (Moet & Chandon, Hennessy, Cloudy Bay, and Château d'Yquem), while Constellation Brands markets a portfolio of medium- and lower-quality brands that are sold at much lower price points (e g , Banrock Station, Paul Masson, J Roget, Fleischmann's) Similarly, in the hotel industry, Choice Hotel's brand portfolio (Sleep Inn, Econo Lodge, Quality Inn, Clarion, Comfort Inn, Comfort Suites, Rodeway Inn, MainStay Suites) has a different quality and price positioning than that of Starwood (Four Points, Sheraton, St Regis, Westin, W)

Research Design

Data

To explore empirically the performance impact of brand portfolio strategy, we used the firms in the American Customer Satisfaction Index (ACSI) as our sampling frame The ACSI collects annual data from more than 65,000 U S consumers of the products and services of more than 200 *Fortune* 500 companies (in 40 different industries whose sales account for approximately 42% of U S gross domestic product) to measure consumers' evaluations of their consumption experiences (for details, see Fornell et al 1996) This is an appropriate sampling frame for two main reasons First, the ACSI collects data on several consumer brand perceptions that are required to operationalize the constructs of interest in our study Second, most ACSI firms are publicly traded, which enables us to collect performance data from secondary sources As detailed subsequently, we also collected data on both brand portfolio characteristics and several industry- and firm-level control variables from other secondary sources, including Hoover's and COMPUSTAT Table 1 provides descriptive statistics for each of the variables in our data set

TABLE 1
Descriptive Statistics (N = 447)

Variable	M	SD	SE	Minimum	Mdn	Maximum
Firm Performance						
Tobin's q	1 620	1 121	053	097	1 317	8 829
Cash flow	2,655	4,746	224	–1,150	886	33,764
Cash flow variability	3 340	782	037	000	3 349	7 415
Advertising spending-to-sales ratio	036	041	002	000	025	216
SG&A-to-sales ratio	233	084	004	038	236	486
Customer loyalty	70 614	7 726	365	54 500	70 466	90 301
Relative market share	261	218	010	009	172	905
Brand Portfolio Strategy						
Number of brands	18 031	20 640	976	1 000	12 000	79 000
Number of segments	4 935	6 053	286	1 000	2 000	35 000
Intraportfolio competition	18 032	14 016	663	000	14 786	69 803
Relative perceived quality	83 298	6 616	313	56 888	84 563	93 827
Relative perceived price	60 189	2 829	134	51 578	60 596	68 024
Firm and Industry Covariates						
Size (total assets)	28,190	57,035	2,698	372	8,070	370,782
HHI (market concentration)	353	168	008	155	284	828
Services dummy	134	341	016	000	000	1 000
Long interpurchase dummy	398	490	023	000	000	1 000

Notes SG&A = selling, general, and administrative expenses, and HHI = Hirschman–Herfindahl index

Brand portfolio strategy measures Brand portfolio scope comprises two variables First, we collected data on the number of brands owned by each firm in our data set from Hoover's, which provides company information based on 10-K Securities and Exchange Commission filings To ensure data consistency, we only counted the brands owned by each firm that are marketed in the industries for which the ACSI collects data As Table 1 shows, the mean number of brands owned by the firms in these industries in our data set was greater than 18, with a median of 12 Second, for each industry for which we had ACSI data for a firm in our data set, we collected data on the number of segments (number of separate North American Industry Classification System operating codes) in which the firm marketed its brands from the Hoover's database and validated this using COMPUSTAT data (correlation > 9) The mean number of market segments in which the firms competed was close to 5, with a median of 2

Intraportfolio competition pertains to the extent to which a firm markets multiple brands that compete with one another for consumer spending We operationalized this measure as the interaction of two latent factors, the first of which captures the extent to which the firm markets multiple brands that appeal to demographically similar consumers in the same market segment and the second of which indicates the extent to which consumers perceive the brands in the firm's portfolio as being positioned similarly The intuition is that when a firm markets multiple brands that appeal to similar consumers and are perceived by these consumers as being positioned similarly, higher intraportfolio competition is likely to occur

The first factor captures the extent to which the firm markets multiple brands to the same consumers using two indicants (1) the number of brands marketed by the firm per market segment in which the firm competes (number of brands/number of segments served) and (2) a demographic dissimilarity score for the consumers of the firm's brands computed using consumer-level ACSI data on sex, age, income level, education, household size, and ethnicity Using ACSI data, the second factor captures the similarity of the positioning of the brands in the firm's portfolio as the standard deviations of the perceived quality and perceived price reported by consumers for the brands the firm owns Together, these two factors explain 82% of the variance in the four indicants and are clearly separable[1] We scaled both factors to range from 0 to 10 and computed their interaction term to use as our measure of intraportfolio competition To assess the face validity of our measure, we selected six pairs of firms operating in six different markets in which the relative degree of intraportfolio competition of each firm is well known and significantly different within each pair In each case, our measure correctly indicated these known differences (see Appendix A)

Finally, we assessed brand portfolio positioning using two variables from the ACSI perceived quality and perceived price The perceived quality of the brands in the firm's portfolio is a latent variable estimated using consumer responses to three questions as indicators, overall quality, reliability, and customization This variable is scaled to range from 0 (low) to 100 (high), the mean level of perceived quality of the brand portfolios of the firms in our sample is greater than 83 We computed the perceived price of the brands in the firm's portfolio by regressing perceived quality onto the ACSI's consumer perceived value measure (a latent variable estimated from consumer responses to questions about quality given price and about price given quality) and estimating the residuals These residuals represent the variance in customer perceived value that is not explained by perceived quality Because perceived value is defined and measured in terms of customers' perceptions of the product/service quality obtained for the price paid (e g , Zeithaml 1988), these residuals are an appropriate indicator of perceived price We then rescaled the perceived price variable and inverted it to range from 0 (lower perceived price) to 100 (higher perceived price), in our sample, the average level is approximately 60 To assess the face validity of our measure, we selected five pairs of firms operating in five different markets in which the relative price of the brands in each firm's portfolio is well known and is different within each pair In each case, our measure correctly indicated these known differences (see Appendix A)[2] In addition, the relative ordering of firms in the other industries in our data set on the perceived price variable aligned well with expectations based on known price information

Marketing performance measures We examine the efficiency of firms' marketing resource utilization using two indictors the ratio of advertising spending to sales (COMPUSTAT items No 45 No 12) and the ratio of selling, general, and administrative (SG&A) spending to sales (COMPUSTAT items Nos 189–45 No 12) As Table 1 shows, the mean relative advertising expenditure among the firms in our sample was approximately 3 6% of sales revenue, and the mean SG&A expenditure was 23 3% of sales revenue

To indicate the effectiveness of the firm's marketing efforts, we use two variables First, we obtained consumer loyalty to the brands in the firm's brand portfolio from the ACSI database This is a latent variable comprising consumer responses to one repurchase likelihood question ("How likely are you to repurchase this brand/company?") and one price sensitivity question ("How much could the price for this brand/company be raised and you would still purchase it?") This measure is scaled between 0 (less loyal) and 100 (more loyal), in our sample, the average is greater than 70 Second, using ACSI industry definitions, we computed industry-level aggregate sales and divided this by each individual firm's sales in the industry to obtain relative market shares for the companies in our data set.[3] We assessed external validity for this measure by comparing it with the equivalent market share figures provided by Market Share Reporter for the 15% of the firms in our data set for which these data were available (correlation > 89) The mean relative market share in our sample was approximately 26%, with a median value of 17% (Table 1)

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[1] All own-factor loadings are greater than 82, with cross-loadings all below 26, and a second-order factor analysis explains 53% of the variance in the two first-order factors

[2] The relative closeness of the perceived price scores compared with those of intraportfolio competition in Appendix A is to be expected because our ACSI sampling frame primarily includes mass-market suppliers, which limits more extreme price differences

[3] For every ACSI industry sector, data are collected for the largest (by sales revenue) firms, which collectively accounts for at least 70% of the total sales in that industry Therefore, the market

Financial performance measures Because managers must balance both current and future financial performance and risks versus returns, we selected three measures of financial performance that are both commonly used by managers and investors and advocated by researchers in different disciplines Tobin's q, cash flow, and cash flow variability

Tobin's q compares a firm's market value with the replacement cost of its assets This is a forward-looking measure of firm performance favored by economists because it represents investors' expectations about the risk-adjusted future cash flows of the firm (Anderson, Fornell, and Mazvancheryl 2004, Lewellen and Badrinath 1997) Along with COMPUSTAT data, we used Chung and Pruitt's (1994) method to compute Tobin's q as follows

$$Q = \frac{MVCS + BVPS + BVLTD + BVINV + BVCL - BVCA}{BVTA},$$

where

MVCS = the market value of the firm's common stock shares,
BVPS = the book value of the firm's preferred stocks,
BVLTD = the book value of the firm's long-term debt,
BVINV = the book value of the firm's inventories,
BVCL = the book value of the firm's current liabilities,
BVCA = the book value of the firm's current assets, and
BVTA = the book value of the firm's total assets

Tobin's q levels greater than 1 0 indicate a positive value for the firm's intangible assets The mean Tobin's q value for the firms in our data set was greater than 1 6, with a median greater than 1 3 Because this variable had a nonnormal distribution in our data set, we normalized it by applying a standard log-transformation [4]

Cash flow has been advocated as an accrual accounting-based indicator of current shareholder value (Neill et al 1991, Srivastava, Shervani, and Fahey 1998), which is more reliable than reported profits because it is less dependent on firms' accounting practices (e g , Dechow, Kothari, and Watts 1998, Sloan 1996) We used COMPUSTAT data to compute net operating cash flow for each firm in our data set as EBIT + Depreciation – Taxes (e g , Vorhies and Morgan 2003) The mean cash flows for the firms in our data set exceeded $2 6 billion, and the median cash flows were approximately $886 million These cash flows were nonnormally distributed in our data set, and therefore we applied a log-transformation to normalize the data [5]

Cash flow variability has been advocated as another important dimension of a firm's financial performance (Gruca and Rego 2005, Srivastava, Shervani, and Fahey 1998) This measure reflects stability (and, thus, risk level) of a firm's cash flows We computed it as the coefficient of variation of the previous five years net operating cash flows This measure is a ratio scale, with a lower bound of zero and no theoretical maximum For our data set, the mean and median cash flow variability was approximately 3 3

Control variables To control for the effects of different circumstances facing firms and their customers in our data set, we include several firm- and industry-level covariates in our analyses With regard to firm size, using COMPUSTAT data, we computed the natural log of the book value of each firm's assets to control for scale economies that may not be captured by market share The mean asset value of the firms in our data set was greater than $28 billion, with a median of $8 billion

The Hirschman–Herfindahl index (HHI), the sum of the square of all suppliers' market shares in an industry, is the most widely used market structure indicator and has been found to influence both firm conduct and performance (e g , Montgomery and Wernerfelt 1991) We used COMPUSTAT data to compute HHI values for each of the industries in our data set The HHI ranges between 0 (less concentrated and, therefore, more competitive) and 1 (more concentrated and, therefore, less competitive) As Table 1 shows, the mean HHI value of less than 36 and median below 29 suggest that the industries in our data set were competitive during this period

To control for other industry effects, we included two dummy variables in our analyses ACSI sector definitions to identify physical goods–focused versus service-focused (labeled "services") firms and the ASCI survey data collection protocol for each industry pertaining to the time frame over which consumers are asked to consider their product and service consumption to indicate firms that face shorter (three months or less) versus longer (more than three months) interpurchase cycles (labeled "long") As Table 1 shows, approximately 13% of the firm-year observations in our sample are from service firms, and approximately 40% of the firm-year observations in our sample have long interpurchase cycles

We removed utilities firms from our data set, because their largely monopoly position is atypical, and Internet-based firms, because we have limited data for these (the ACSI included Internet-based firms only in 2000) We also removed privately held firms in which financial data required for our analyses are not available Finally, we removed 18 influential observations from our data set, based on studentized residuals, Cook's distance, and DFFITS scores (Kennedy 2003) The final data set contained 447 firm-year observations for which we had com-

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shares we compute are relative to the major suppliers in each industry

[4] Because the Tobin's q data included some small positive values, we applied the log-transformation to q + 1

[5] The cash flow data contained some small positive values and some negative values To preserve all observations and continuity of the transformed variable, we applied the log-transformation to (cash flows +1) for positive values and to (cash flows –1) for negative values

plete data—at least three consecutive years of complete data for a firm for all variables across all seven equations, representing 72 different firms, over a ten-year period (1994–2003) Tables 1 and 2 provide descriptive statistics and correlations for the variables in our data set (Appendix B lists the firms in our data set)

Model Formulation

We use a system of simultaneous regressions to examine the associations between firms' brand portfolio characteristics and their business performance for three primary reasons First, several variables (i e , consumer loyalty, market share, advertising, and SG&A expenditures) are both independent and dependent variables in different regressions, which raises endogeneity concerns Such concerns are alleviated when all regressions are simultaneously estimated as a system Second, because the overlap between each regression equation is significant, the error terms of different regressions are likely to be correlated Failure to account for this through a system of equations is likely to result in inefficient estimates Third, a system of equations provides a statistically flexible but easy-to-interpret methodological framework The system of equations estimated is as follows

$$
\left\{
\begin{aligned}
\mathrm{Q}_t &= \beta_{\mathrm{Q}0} + \beta_{\mathrm{Q}1}\mathrm{CF}_t + \beta_{\mathrm{Q}2}\mathrm{CV}_t + \beta_{\mathrm{Q}3}\mathrm{ADV}_t + \beta_{\mathrm{Q}4}\mathrm{SG\&A}_t \\
&\quad + \beta_{\mathrm{Q}5}\mathrm{LOYAL}_t + \beta_{\mathrm{Q}6}\mathrm{SHARE}_t + \beta_{\mathrm{Q}7}\mathrm{BRANDS}_t \\
&\quad + \beta_{\mathrm{Q}8}\mathrm{SEGMS}_t + \beta_{\mathrm{Q}9}\mathrm{COMP}_t + \beta_{\mathrm{Q}10}\mathrm{PRICE}_t \\
&\quad + \beta_{\mathrm{Q}11}\mathrm{QUAL}_t + \beta_{\mathrm{Q}12}\mathrm{SIZE}_t + \beta_{\mathrm{Q}13}\mathrm{HHI}_t \\
&\quad + \beta_{\mathrm{Q}14}\mathrm{SERVICES}_t + \beta_{\mathrm{Q}15}\mathrm{LONG}_t + \varepsilon_{\mathrm{Q}t} \\
\mathrm{CF}_t &= \beta_{\mathrm{CF}0} + \beta_{\mathrm{CF}1}\mathrm{ADV}_t + \beta_{\mathrm{CF}2}\mathrm{SG\&A}_t + \beta_{\mathrm{CF}3}\mathrm{LOYAL}_t \\
&\quad + \beta_{\mathrm{CF}4}\mathrm{SHARE}_t + \beta_{\mathrm{CF}5}\mathrm{BRANDS}_t + \beta_{\mathrm{CF}6}\mathrm{SEGMS}_t \\
&\quad + \beta_{\mathrm{CF}7}\mathrm{COMP}_t + \beta_{\mathrm{CF}8}\mathrm{PRICE}_t + \beta_{\mathrm{CF}9}\mathrm{QUAL}_t \\
&\quad + \beta_{\mathrm{CF}10}\mathrm{SIZE}_t + \beta_{\mathrm{CF}11}\mathrm{HHI}_t + \beta_{\mathrm{CF}12}\mathrm{SERVICES}_t \\
&\quad + \beta_{\mathrm{CF}13}\mathrm{LONG}_t + \varepsilon_{\mathrm{CF}t} \\
\mathrm{CV}_t &= \beta_{\mathrm{CV}0} + \beta_{\mathrm{CV}1}\mathrm{ADV}_t + \beta_{\mathrm{CV}2}\mathrm{SG\&A}_t + \beta_{\mathrm{CV}3}\mathrm{LOYAL}_t \\
&\quad + \beta_{\mathrm{CV}4}\mathrm{SHARE}_t + \beta_{\mathrm{CV}5}\mathrm{BRANDS}_t + \beta_{\mathrm{CV}6}\mathrm{SEGMS}_t \\
&\quad + \beta_{\mathrm{CV}7}\mathrm{COMP}_t + \beta_{\mathrm{CV}8}\mathrm{PRICE}_t + \beta_{\mathrm{CV}9}\mathrm{QUAL}_t \\
&\quad + \beta_{\mathrm{CV}10}\mathrm{SIZE}_t + \beta_{\mathrm{CV}11}\mathrm{HHI}_t + \beta_{\mathrm{CV}12}\mathrm{SERVICES}_t \\
&\quad + \beta_{\mathrm{CV}13}\mathrm{LONG}_t + \varepsilon_{\mathrm{CV}t} \\
\mathrm{ADV}_t &= \beta_{\mathrm{ADV}0} + \beta_{\mathrm{ADV}1}\mathrm{BRANDS}_t + \beta_{\mathrm{ADV}2}\mathrm{SEGMS}_t \\
&\quad + \beta_{\mathrm{ADV}3}\mathrm{COMP}_t + \beta_{\mathrm{ADV}4}\mathrm{PRICE}_t + \beta_{\mathrm{ADV}5}\mathrm{QUAL}_t \\
&\quad + \beta_{\mathrm{ADV}6}\mathrm{SIZE}_t + \beta_{\mathrm{ADV}7}\mathrm{HHI}_t + \beta_{\mathrm{ADV}8}\mathrm{SERVICES}_t \\
&\quad + \beta_{\mathrm{ADV}9}\mathrm{LONG}_t + \varepsilon_{\mathrm{ADV}t} \\
\mathrm{SG\&A}_t &= \beta_{\mathrm{SG\&A}0} + \beta_{\mathrm{SG\&A}1}\mathrm{BRANDS}_t + \qquad + \varepsilon_{\mathrm{SG\&A}t} \\
\mathrm{LOYAL}_t &= \beta_{\mathrm{LOY}0} + \beta_{\mathrm{LOY}1}\mathrm{BRANDS}_t + \qquad + \varepsilon_{\mathrm{LOY}t} \\
\mathrm{SHARE}_t &= \beta_{\mathrm{MS}0} + \beta_{\mathrm{MS}1}\mathrm{BRANDS}_t + \qquad + \varepsilon_{\mathrm{MS}t},
\end{aligned}
\right.
$$

where Q is the firm's Tobin's q, CF its net operating cash flows, CV is cash flow variability, ADV and SG&A are the firm's advertising and sales, general, and administrative costs, respectively, as a proportion of their sales revenue, LOYAL is consumer loyalty to the brands in the firm's portfolio, and SHARE is the firm's relative market share Each firm's brand portfolio strategy is represented by BRANDS, the number of brands owned and marketed by the firm, SEGMS, the number of segments in which the firm markets its brands, COMP, the extent to which brands in the firm's portfolio compete with one another, PRICE, the average level of perceived price among consumers of brands in the firm's portfolio, and QUAL, the average level of perceived quality among consumers of brands in the firm's portfolio Finally, SIZE is the natural log of the firm's assets, HHI is the Hirschman–Herfindahl index measure of market concentration, and SERVICES and LONG are dummy variables that identify a firm as a service (versus goods) producer, with longer (versus shorter) interpurchase cycles

In line with the efficient market hypothesis (Fama 1970, Samuelson 1965), the system of equations we outlined uses contemporaneous independent and dependent variables Although this is particularly appropriate for our Tobin's q dependent, to allow for potential lagged effects, we also ran a second system of equations using one-year lagged performance dependents We estimated both systems of equations using three-stage least squares and assumed that the seven dependent variables were endogenous to the model Because time-series cross-sectional panel data sets also present the potential for estimation bias and efficiency problems associated with serial correlation (Kennedy 2003), we estimated our model using the robust Newey–West method (Cecchetti, Kashyap, and Wilcox 1997, Eckbo and Smith 1998) Subsequent analyses indicate that our results are robust First, Hausman tests (Boulding and Staelin 1995, Greene 2003) indicated that fixed-effect corrections are necessary for our regressions Because we already control for various firm and industry covariates in our model, we accomplished this with the additional introduction of year-specific dummies (Kennedy 2003) Second, Durbin-Watson and White's test (Kennedy 2003) statistics suggested that with the inclusion of the year dummies, serial correlation was not a significant problem in our regressions Third, we calculated the mean absolute percent error (MAPE) by calibrating our model on two-thirds of the data and using the remaining one-third of the data to compute MAPE Over 25 different random runs, the MAPE was never higher than 10% Finally, we also ran individual year cross-sectional regressions, and the resultant estimates were similar in magnitude and direction to those obtained using the time-series data

In addition, we tested for violations of standard regression assumptions regarding model misspecification using Ramsey's (1969) RESET test, normality using the Jarque–Bera test, and heteroskedasticity using the Breusch-Pagan test None of these violations appear to be either generalized or problematic in our data Variance inflation and condition index statistics that are well below standard cutoffs indicate no particular problems with multicollinearity in our regressions We further tested the potential influence of

TABLE 2
Construct Correlations (N = 447)

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1 Tobin's q	1 00															
X2 Cash flows	100	1 00														
X3 Cash flow variability	−344	−176	1 00													
X4 Advertising-to-sales ratio	400	−063	−203	1 00												
X5 SG&A-to-sales ratio	310	−077	−103	438	1 00											
X6 Customer loyalty	435	007	−231	305	141	1 00										
X7 Relative market share	201	208	−173	023	012	004	1 00									
X8 Number of brands	507	067	−238	560	348	457	093	1 00								
X9 Number of segments	202	003	−044	144	057	336	098	594	1 00							
X10 Intraportfolio competition	338	127	−201	437	152	327	134	633	106	1 00						
X11 Perceived price	283	050	−168	321	346	442	079	536	376	498	1 00					
X12 Perceived quality	313	133	−180	356	193	522	054	569	418	649	856	1 00				
X13 Size (total assets)	−216	655	−049	−256	−129	−111	220	−027	−061	077	026	075	1 00			
X14 HHI (market concentration)	146	−121	−076	379	128	066	480	059	072	189	257	241	−230	1 00		
X15 Services	−221	−072	106	−239	−044	−225	−054	−319	−255	−466	−351	−475	−055	−203	1 00	
X16 Long interpurchase time	−553	164	275	−357	−206	−489	−115	−439	−326	−312	−446	−342	430	−331	296	1 00

Notes All correlations with absolute value greater than 11 are significant at the $p <$ 01 level, and those greater than 09 are significant at the $p <$ 05 level multicollinearity by reestimating our system of equations and removing each independent variable one at a time, the magnitude and significance of the remaining estimates showed no material changes Finally, for the five most highly correlated variables, we orthogonalized cash flow and firm size and the intraportfolio competition, perceived quality, and perceived price brand portfolio strategy variables and then reestimated our system of equations The pattern of results revealed no material differences from those we report in Table 3, Panels A and B

Results and Discussion

Panels A and B in Table 3 contain the R-square values we obtained when entering the variables in each regression equation in five sets the intercept + (1) year dummies, (2) firm and industry control variables, (3) current cash flow performance (for Tobin's q equation only), (4) marketing performance variables, and (5) brand strategy variables The regression coefficients for each independent variable reported in Table 3 are for the final regression runs in which all the independent variables are entered simultaneously As we expected, the coefficients for the firm and industry control variables and incremental R-square values (ranging from 4 8%–42%) indicate significant effects on all our performance dependents In line with industrial organization theory, these results indicate that larger firms tend to have greater cash flows and higher market shares with lower Tobin's q, relative advertising and SG&A spending, and customer loyalty[6] Similarly, we find that market concentration (HHI) is associated negatively with firms' cash flows and consumer loyalty and positively with market share and relative advertising expenditures[7] Furthermore, our results indicate that service firms tend to have higher customer loyalty and market share, and those with long interpurchase cycles tend to have lower Tobin's q, cash flows, consumer loyalty, and market shares, along with higher cash flow variability

From a financial performance perspective, our results indicate that firms' marketing effectiveness and efficiency explain significant additional variance Panels A and B in Table 3 show that R-square increases when the marketing performance variables are added into the regressions of 9 9% and12 1% in firms' contemporaneous and lagged Tobin's q, respectively, 9 7% and 12 3% in firms' contemporaneous and lagged cash flows, respectively, and 3 8% and 3 5% in contemporaneous and lagged cash flow variance, respectively That these four marketing performance outcomes are significantly associated with contemporaneous and lagged cash flow returns and their associated risks and, in turn, with Tobin's q provides new evidence linking marketing with shareholder value (Rust et al 2004)

More specifically, consistent with marketing theory regarding the intangible asset value of customer relationships, we find that consumer loyalty is positively associated with firms' Tobin's q However, this relationship appears not to be a result of the level or stability of firms' cash flows, because consumer loyalty is not significantly associated with either of these dependents in our regressions The insignificant relationship to cash flow levels may be a result of the costs often associated with gaining customer loyalty (e g , Reinartz and Kumar 2002, Shugan 2005) The variability result is consistent with the suggestion that attitudinal loyalty may not be enough to ensure customer retention and with evidence that consumers' stated repurchase intentions are not necessarily good indicators of their subsequent behaviors (e g , Seiders et al 2005)

Consistent with industrial organization market power arguments, we observe that relative market share is associated positively with firms' Tobin's q and cash flow levels and negatively with cash flow variability We also find that firms that spend a greater proportion of their revenues on advertising have higher cash flows and lower cash flow variability, while those that spend relatively more on SG&A have higher Tobin's q performance The effect of relative advertising expenditures on cash flow returns and risks but not directly on Tobin's q suggests that the financial market "value relevance" of advertising expenditures is captured through its observed effects on accounting indicators of financial performance In contrast, the direct SG&A expenditure effects on Tobin's q suggest that the impact of these investments is not adequately captured in accounting measures of cash flow risks and returns[8] Overall, this indicates that advertising expenditures can be more than recouped through increases in the level and stability of demand and that nonadvertising expenditures associated with the marketing of firms' products and services increase the intangible asset value of the firm This finding strengthens marketers' assertions that though marketing costs are typically treated as expenses, they can also generate significant paybacks and therefore can legitimately be viewed as investments (e g , Ambler 2003)

Our regression results indicate that a firm's brand portfolio strategy also explains significant additional variance in each of the financial and marketing performance dependents We observe significant R-square increases in the contemporaneous (lagged) financial performance regressions of 8% (7 5%) in Tobin's q and 20 7% (17 8%) and 2 3% (2 3%) in cash flow levels (variability) when we enter the brand portfolio strategy variables into the regression equations With standard deviations of $33 2 billion in market capitalization and $4 7 billion in cash flows in our sample, these results indicate that a firm's brand portfolio characteristics have a nontrivial economic importance Furthermore, these R-square increases should be viewed as somewhat conservative Both Tobin's q and cash flows are corporate-level financial performance outcomes, and though many of the firms in our data set operate in more than one industry and across multiple countries, our brand strategy data cover

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[6] To ensure that using tangible asset value as our size control did not introduce collinearity problems in our Tobin's q equation, we reran the regression without the size control, which produced materially the same results

[7] This relationship is intuitive because higher HHI levels indicate concentration of market share in the hands of a few large players and the firms in the ACSI are among the largest in their respective industries

[8] Because we capture only two accounting indicators of financial performance, this does not necessarily imply stock market inefficiency with respect to firms' SG&A spending

TABLE 3
Standardized Three-Stage Least Squares Regression Results

A: Contemporaneous Independent and Dependent Variables

Independent Variables	Tobin's q_t	Cash Flows$_t$	Cash Flow Variability$_t$	Advertising Spending-to-Sales Ratio$_t$	SG&A-to-Sales Ratio$_t$	Customer Loyalty$_t$	Market Share$_t$
	Dependent Variables						
Financial performance							
Cash flows$_t$	243**						
Cash flow variability$_t$	– 052*						
Marketing Performance							
Advertising spending-to-sales ratio$_t$	– 033	059**	– 084*				
SG&A-to-sales ratio$_t$	141**	017	004				
Customer loyalty$_t$	246**	– 004	– 045				
Relative market share$_t$	177**	089**	– 162**				
Brand Portfolio Strategy							
Number of brands$_t$	453**	004	– 146*	867**	558**	241**	– 111*
Number of segments$_t$	– 270**	– 049*	145*	– 351**	– 238**	– 091*	282**
Intraportfolio competition$_t$	– 156**	– 050	057	– 279**	– 245**	– 273**	220**
Relative perceived quality$_t$	308**	215**	– 147	304**	– 398**	628**	– 295**
Relative perceived price$_t$	– 356**	– 154**	073	– 246**	603**	– 147	– 056
Firm and Industry Controls							
Size (total assets)$_t$	– 244**	720**	– 102	– 164**	– 164**	– 130**	431**
HHI (market concentration)$_t$	– 070	– 065**	101	288**	048	– 096**	665**
Services dummy$_t$	– 046	058	– 008	– 056	– 055	074*	110**
Long interpurchase time dummy$_t$	– 360**	– 185**	286**	035	146	– 364**	– 161*
Incremental Adjusted R^2 Changes							
Intercept only	0%	0%	0%	0%	0%	0%	0%
+ Year dummies	5%	2 4%	1 8%	4%	1 0%	2 4%	4%
+ Industry controls	20 1%	23 7%	6 6%	38 9%	20 6%	44 4%	29 2%
+ Financial performance	37 4%	—	—	—	—	—	—
+ Marketing performance	47 3%	33 4%	10 4%	—	—	—	—
+ Brand portfolio strategy	55 3%	54 1%	12 7%	50 9%	29 0%	60 6%	36 9%

B: One-Year Lagged Dependent Variables

Independent Variables	Tobin's q_{t+1}	Cash Flows$_{t+1}$	Cash Flow Variability$_{t+1}$	Advertising Spending-to-Sales Ratio$_{t+1}$	SG&A-to-Sales Ratio$_{t+1}$	Customer Loyalty$_{t+1}$	Market Share$_{t+1}$
	Dependent Variables						
Financial Performance							
Cash flows$_t$	242**						
Cash flow variability$_t$	– 038*						
Marketing Performance							
Advertising spending-to-sales ratio$_t$	– 043	057**	– 094**				
SG&A-to-sales ratio$_t$	145**	021	002				
Customer loyalty$_t$	267**	– 006	– 032				
Relative market share$_t$	185**	090**	– 159**				
Brand Portfolio Strategy							
Number of brands$_t$	469**	001	– 131	899**	554**	208**	– 119*
Number of segments$_t$	– 295**	– 050*	167*	– 392**	– 285**	– 086*	297**
Intraportfolio competition$_t$	– 174**	– 038	091	– 274**	– 258**	– 256**	248**

TABLE 3
Continued

Relative perceived quality$_t$	317**	210**	– 199	297**	– 377**	752**	– 283**
Relative perceived Price$_t$	– 372**	– 155**	096	– 224**	564**	– 258**	– 034
Firm and Industry Controls							
Size (total assets)$_t$	– 248**	709**	– 115*	– 162**	– 151**	– 122**	436**
HHI (market concentration)$_t$	– 058	– 064**	087	305**	078	– 134**	645**
Services dummy$_t$	– 058	069*	– 007	– 059	– 057	074**	149**
Long interpurchase time dummy$_t$	– 353**	– 175**	324**	040	122*	– 408**	– 159**
Incremental Adjusted R^2 Changes							
Intercept only	0%	0%	0%	0%	0%	0%	0%
+ Year dummies	4%	2 2%	1 8%	3%	9%	2 3%	9%
+ Industry controls	20 2%	23 9%	6 7%	38 4%	20 3%	44 2%	28 6%
+ Financial performance	35 5%	—	—	—	—	—	—
+ Marketing performance	47 6%	36 2%	10 2%	—	—	—	—
+ Brand portfolio strategy	55 1%	54 0%	12 5%	50 7%	28 4%	60 1%	37 1%

*p < 05
**p < 01
Notes All coefficients reported result from estimating the system of equations with all independent variables entered into the regressions simultaneously

only the industries in which U S consumers of their brands are tracked within the ACSI[9] For the marketing performance dependents we examine, the increases in R-square resulting from entering the brand portfolio strategy variables range from 7 7% of market share to 16 2% of consumer loyalty This indicates that brand portfolio characteristics are important predictors of firms' marketing performance and financial performance

In terms of the specific dimensions of brand portfolio strategy examined, from a brand portfolio scope perspective, we find that the number of brands owned and marketed by a firm is positively associated with the firm's Tobin's q and consumer loyalty performance as well as with lower contemporaneous cash flow variability However, the number of brands in the firm's portfolio is also negatively associated with market share and is associated with higher relative advertising and SG&A spending Because the three financial performance dependent regressions already incorporate firms' advertising and SG&A costs and market shares, larger brand portfolios would seem broadly desirable From a short-term accounting perspective, our results indicate that though marketing a greater number of brands may not enhance cash flows, it reduces their variability, and from a forward-looking corporate finance perspective, larger brand portfolios may also increase the firm's relative (to its tangible assets) stock value

Our results also indicate that marketing the firm's brands across a greater number of market segments is associated with lower relative advertising and SG&A expenditures and higher market shares, but it is also associated positively with cash flow variability and negatively with firms' Tobin's q, cash flow, and consumer loyalty performance This suggests some economy-of-scope and -scale benefits of selling the firm's brands across multiple segments in terms of lower marketing expenditures and greater market share However, our results also indicate that brand equity dilution when marketing brands across different market segments can make this costly in terms of consumer loyalty and the level and stability of cash flows and that this is reflected in financial market valuations of the firm's brand assets

From a brand portfolio competition perspective, our results indicate that competition among the brands in a firm's portfolio is unrelated to the firm's cash flow performance but is associated with lower Tobin's q values However, the significant, negative relationships between intraportfolio competition and relative SG&A and advertising spending indicate some support for arguments that "internal market" competition among a firm's brands is a mechanism for efficiently deploying firm resources (e g , Shocker, Srivastava, and Ruekert 1994) At the same time, the negative relationship observed to consumer loyalty indicates that in addition to the marketing expenditure efficiency benefits of "eating your own lunch," there is an associated "cannibalization" cost However, because consumer loyalty is measured at the brand level in the ACSI but only reported at the firm (i e , brand portfolio) level, a reduction in consumer loyalty does not necessarily mean that the firm will lose consumers Indeed, if less loyal consumers switch, they are more likely to switch to another brand within the portfolio of a firm that has higher levels of competition among its brands There is evidence of this in our data, with a positive relationship between intraportfolio competition and firms' relative market share, despite the significant, negative association with consumer loyalty

From a positioning perspective, our results indicate that, in general, a higher-quality positioning of a firm's brand portfolio is associated with stronger financial and marketing performance, while a higher-price positioning is not Perceived quality is positively associated with firms' Tobin's q and cash flow levels, as well as with consumer loyalty and lower relative SG&A spending The only significant, negative associations with perceived quality in our results are higher levels of relative advertising spending and lower market shares The negative association with market share is consistent with arguments about the "exclusivity" drivers of consumer quality perceptions (e g , Hellofs and Jacobson 1999) and may also reflect the difficulty of meeting consumers' "ideal" quality expectations in firms with larger market shares that likely have a more heterogeneous customer base (e g , Fornell 1995) The relationship between perceived quality and relative advertising spending is consistent with consumers' use of advertising as a quality cue (e g , Kirmani and Rao 2000) Such investments in perceived quality and advertising appear to make selling the firm's brands easier, as reflected in the lower SG&A costs observed

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[9] For the firm-year observations in our data set, the mean proportion of total revenue not accounted for by U S sales in the industries covered by the ACSI is 20%

Our results indicate that higher-price perceptions of a firm's brand portfolio among consumers are associated with lower Tobin's q and cash flow performance and higher relative SG&A but lower advertising spending We also observe a significant, negative relationship to lagged consumer loyalty One interpretation of these findings is that because our perceived price measure is the result of a regression of value on quality (and therefore is inherently relative to perceived quality), consumers may "punish" firms they view as having prices that are higher than those that may be justified by the quality of their products and services This would translate into higher selling costs being involved in overcoming value-based sales objections, lower cash flows, and lower investor expectations regarding future cash flow returns In addition, if firms use simple percentage-of-sales heuristics to determine advertising spending, this may also account for the lower relative advertising spending observed

Finally, the correlations in Table 2 provide some initial insights into how firms' brand portfolio strategy may be driven in part by the characteristics of the industry in which they operate Although we do not impute causality, the correlations in our data indicate that, in general, service-focused firms and those that have longer interpurchase cycles have fewer brands and sell these in fewer market segments, have lower levels of intraportfolio competition, and have lower perceived quality and price positioning in their brand portfolios Firms operating in more concentrated markets also seem to have brand portfolios that exhibit greater intraportfolio competition and that are viewed by consumers as being generally higher in quality and price

Implications

Our study has several important implications for researchers and managers First, we provide new insights into the link between firms' marketing effectiveness and efficiency and their financial performance Our results suggest that two criteria often used to set marketing goals and evaluate marketing effectiveness are associated with firms' financial performance The positive, significant relationship between relative market share and firms' Tobin's q and cash flow performance (levels and variability) indicates that despite past controversies, market share can indeed be a useful metric for assessing marketing effectiveness Similarly, the positive relationship between consumer loyalty and Tobin's q indicates that attitudinal loyalty metrics can be useful criteria for assessing the effectiveness of firms' marketing efforts However, our results also indicate that efficiency-enhancing efforts to reduce marketing expenditures can be counterproductive We find that relative advertising spending is positively related to firms' cash flow levels and negatively associated with cash flow variability (e g , McAlister, Srinivasan, and Kim 2007), though it is unrelated to Tobin's q We also find that relative SG&A spending is significantly, positively related to Tobin's q, but it is not significantly, negatively associated with either cash flow levels or variability This suggests that in contrast to current accounting conventions, marketing spending appears to be an investment rather than an expense

Second, although previous studies have identified brand equity as an important intangible asset, our research offers the first empirical insights into how a firm's brand portfolio strategy affects its business performance For managers, the most obvious implication of our study is that strategic decisions about a firm's brand portfolio significantly affect the firm's subsequent marketing and financial performance Our results suggest that these brand strategy portfolio effects are not small, explaining 2%–21% of the variance in firms' financial performance and 8%–16% of the variance in their marketing effectiveness and efficiency From a financial performance perspective, the brand portfolio scope characteristics of numbers of brands and number of segments in which they are marketed appear to have directionally different effects on different aspects of performance Larger brand portfolios are associated with higher Tobin's q performance and lower contemporaneous cash flow variability, while marketing brands across greater numbers of segments is associated with reduced cash flow levels and Tobin's q performance and higher cash flow variability Consistent with some normative prescriptions and the "theories in use" evident in the actions of a growing number of firms, the negative association with Tobin's q suggests that investors view intraportfolio competition as an indicator of likely lower future financial performance However, this does not appear to be the result of a negative impact on cash flows Finally, from a positioning perspective, brand portfolios with a high-quality positioning enjoy superior performance in terms of both Tobin's q and cash flow levels, while those with a high-price positioning have lower Tobin's q and cash flow performance

From a marketing performance perspective, a greater number of brands marketed across a smaller number of segments, a low level of intraportfolio competition, and strong consumer perceptions of the quality of the firm's brands appear to be the strongest brand portfolio strategy drivers of consumer loyalty Conversely, from a market share maximization perspective, exactly the opposite appears to be true, smaller brand portfolios, marketed across a greater number of segments, with greater intraportfolio competition and lower perceived quality, are associated with greater market share From an efficiency perspective, our data suggest that owning a greater number of brands requires higher relative advertising and SG&A expenditures but that marketing these brands across a greater number of market segments and having greater competition among the firm's brands reduces these expenditures. Notably, however, our results also indicate that different portfolio positioning has directionally different effects on marketing efficiency, with perceived quality being associated with higher advertising expenditures but lower SG&A expenditures, while high price positioning is associated with lower advertising expenditures but higher SG&A spending.

Overall, our results indicate that there is no one simple answer to the fundamental brand portfolio strategy question that senior managers and investors face—namely, What brand portfolio investments deliver the best return? Rather, our findings suggest that a firm's brand portfolio strategy has a complex relationship to firm performance, with several directionally different effects on different aspects of marketing and financial performance. For example, our regression results indicate that exactly the same portfolio strategy may have diametrically opposing results in terms of Tobin's q and market share. Importantly, this suggests that the appropriateness of any brand portfolio strategy is likely to be dependent on the particular performance outcomes desired.

Limitations and Further Research

In interpreting the results of our study, several limitations in our data set should be noted. First, because of data source limitations, our sample contains only large, publicly traded business-to-consumer companies in the United States. Thus, although our findings may be somewhat generalizable across consumer industries, they are not necessarily generalizable to smaller firms, privately held firms, or business-to-business firms. Second, although we include several different industry covariates in our regressions, it is not possible in our analyses to control completely for differences between industries. Third, we are not able to measure directly two of our brand portfolio variables for the firms in our data set (intraportfolio competition and perceived price) and, instead, rely on proxy indicators. Although our face validity tests suggest that these are appropriate proxies, finer-grained insights might be available in firms in which brands' demand cross-elasticities and prices can be directly observed. Fourth, although we examine a wide domain of brand portfolio characteristics, the availability of appropriate data means that we investigate only a relatively limited number of brand portfolio strategy variables. Although the brand portfolio characteristics we examine are significantly related to firms' business performance, we are unable to assess the impact of several other variables (e.g., the value or market shares of each of the brands in the firm's brand portfolio) that the literature indicates may further enhance the understanding of brand portfolio strategy and firm performance.

Beyond the need to address these limitations, our study suggests several worthwhile avenues for additional research. Three areas may be particularly productive for future theory development and testing. First, having demonstrated the magnitude of the effect of brand portfolio characteristics on different aspects of firms' business performance, we believe that it is important to investigate the existence and impact of firm and industry boundary conditions on these relationships. This raises several questions. For example, do firms with smaller numbers of brands in their portfolio perform better when their brands have more abstract rather than concrete associations in the minds of consumers, thus enabling such firms to extend their brand portfolios more safely across a greater number of market segments? Does intraportfolio competition make more sense in markets in which a firm faces relatively homogeneous consumer preferences? Our data also indicate that managers may face important trade-offs in making brand portfolio strategy decisions (e.g., between high-quality and low-price positions) and in using these to drive different aspects of business performance (e.g., marketing the firm's brands across a greater number of segments increases marketing efficiency but also reduces cash flows and Tobin's q). Identifying the existence and impact of boundary conditions that affect the appropriateness and trade-offs involved in different brand strategy portfolio decisions and their impact on multiple aspects of business performance is an important next step in the development of brand portfolio theory.

Second, we focused on several different brand portfolio characteristics but did not explicitly theorize about or empirically examine their interactions, not least because the large number of possible interactions makes analyzing them impractical in our data set. Yet configuration theory indicates that bivariate interactions may offer only a limited viewpoint and suggests that there are likely to be more holistic sets of brand portfolio strategy decisions that could be mutually compatible and self-reinforcing (e.g., Vorhies and Morgan 2003). Our data provide some initial support for this viewpoint. For example, the correlations in Table 2 indicate that in our data set, larger brand portfolios are characterized by broader market coverage, higher levels of intraportfolio competition, and higher-quality and -price positions. Identifying the existence of commonly occurring configurations of brand portfolio strategy variables (i.e., brand portfolio strategy types) and their performance outcomes under different firm, market, and environmental conditions presents an exciting opportunity for theoretically important and managerially relevant research.

Third, robustness checks on our results using random coefficients indicated that the vast majority of variance in our models is cross-sectional and that the firms in our data set do not often significantly change their brand portfolio strategies. Therefore, our results should be interpreted in terms of the levels of the various brand portfolio characteristics of each firm we observe. However, firms can and do make significant changes to their brand portfolio strategies over time. Why and with what consequences are such brand portfolio strategy decisions made? These are critical decisions for senior managers. The ACSI source of much of our brand data means that it is not possible to tie any changes in our brand portfolio strategy variables to a specific date and, therefore, to conduct an event analysis. However, using different information sources, such an approach would allow for the study of changes in individual brand portfolio strategy decisions. This would provide valuable additional insights to senior managers who are considering different brand portfolio strategy decision alternatives.

Conclusions

Many firms own and market a portfolio of brands and make corporate-level strategic decisions about the scope, competition, and positioning characteristics of their brand portfolio. Our empirical examination of 72 *Fortune* 500 firms over the 1994–2003 period indicates that these brand portfolio strategy characteristics have a significant impact on several different aspects of firms' marketing and financial performance. The brand portfolio strategy–business performance relationships we observe are more complex than may have previously been understood. The different effects of the different brand portfolio characteristics on the different aspects of firms' marketing and financial performance revealed in our study indicate that appropriate brand portfolio strategy decisions may depend crucially on the specific performance goals of the firm.

APPENDIX A
Face Validity Assessment for Intraportfolio Competition and Perceived Price Measures

Industry	Known Lower Intraportfolio Competition Player	Intraportfolio Competition Measure Score	Known Higher Intraportfolio Competition Player	Intraportfolio Competition Measure Score
Underwear	Jones Apparel	0	Sara Lee	18.9
Shampoo	Dial	16.5	Unilever	30.5
Detergents	Unilever	22.3	Procter & Gamble	30.5
Autos	Honda	11.5	General Motors	37.4
Hotels	Ramada	0	Hilton	5.8
Department stores	Target	5.1	Federated Department Stores	15.9

Industry	Known Lower Price Portfolio Player	Perceived Price Measure Score	Known Higher Price Portfolio Player	Perceived Price Measure Score
Airlines	Southwest	55.0	American	57.3
Cigarettes	R. J. Reynolds	63.7	Altria	66.5
Athletic shoes	Reebok	59.9	Nike	62.0
Personal computers	Dell	58.3	IBM	61.4
Department stores	J. C. Penney	58.2	Nordstrom	62.4

APPENDIX B
Companies and Industries Included in Complete Case Analysis Data Set

Companies

- Albertson's
- Altria
- American Airlines
- Anheuser-Busch
- Apple Inc.
- Burger King
- Cadbury Schweppes
- Campbell Soup
- Clorox
- Coca-Cola
- Colgate-Palmolive
- ConAgra Foods
- Continental Airlines
- Daimler-Chrysler
- Dell Computer
- Delta Air Lines
- Dillard's
- Dole Food
- Domino's Pizza
- Federated Department Stores
- FedEx
- Ford Motor
- Fruit of the Loom
- General Electric
- General Mills
- General Motors
- General Atlantic & Pacific Tea Company
- Hershey
- Hewlett-Packard
- Hilton Hotels
- H. J. Heinz
- Honda
- IBM
- J. C. Penney
- Kellogg
- Kraft Foods
- Kroger
- Liz Claiborne
- Macy's
- Marriot
- Maytag
- McDonald's
- Molson Coors
- Nestlé
- Nike
- Nissan
- Nordstrom
- Northwest Airlines
- Papa John's
- PepsiCo
- Procter & Gamble
- Reebok
- Reynolds American
- Safeway
- Sara Lee
- Sears Holdings
- Southwest Airlines
- SuperValu
- Target
- Toyota
- Tyson Foods
- Unilever
- United Airlines
- United Parcel Service
- US Airways
- VF Corporation
- Volkswagen
- Wal-Mart Stores
- Wendy's
- Whirlpool
- Winn-Dixie
- Yum Brands

Industries

- Food processing
- Beverages: beer
- Beverages: soft drinks
- Tobacco: cigarettes
- Apparel
- Athletic shoes
- Personal care products
- Personal computers and printers
- Household appliances
- Automobiles
- Parcel delivery/express mail
- Airlines: scheduled
- Department and discount stores
- Specialty retail stores
- Supermarkets
- Fast food, pizza, carryout

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Shibo Li, Kannan Srinivasan, & Baohong Sun

Internet Auction Features as Quality Signals

Internet auction companies have developed innovative tools that enable sellers to reveal more information about their credibility and product quality to avoid the "lemons" problem On the basis of signaling and auction theories, the authors propose a typology of Internet auction quality and credibility indicators, adopt and modify Park and Bradlow's (2005) model, and use eBay as an example to examine empirically how different types of indicators help alleviate uncertainty This empirical evidence demonstrates how Internet auction features affect consumer participation and bidding decisions, what modifies the credibility of quality indicators, and how different buyers react to indicators The signaling-based hypotheses provide coherent explanations of consumers' bidding behavior As the first empirical study to evaluate the signaling role of comprehensive Internet auction institutional features in mitigating the adverse selection problem, this research provides evidence to clarify the economic foundation behind innovative Internet auction designs

Keywords information asymmetry, lemons problem, winner's curse, signaling, consumer bidding strategies, Internet auction, e-commerce, eBay

Internet auctions are characterized by the separation of buyers from sellers (Lucking-Reiley 1999) Typically, Internet auction companies act as auctioneers and do not assign responsibility for items listed on their Web sites, the sellers describe, list, and ship the product and specify payment methods Because shipment usually occurs after the payment has been received (Lucking-Reiley 2000), it is impossible for bidders to inspect the goods before bidding, and buyers bear significant risks for items not delivered or those significantly misrepresented by sellers The impersonal transactions of Internet auctions introduce severe information asymmetry regarding both product quality and seller credibility Thus, compared with customers' decision-making task in bricks-and-mortar retail stores, online auction consumers must make decisions under more severe uncertainty (Cheema et al 2005, Dewally and Ederington 2006)

Without enough information to distinguish good from bad products (i e , uncertainty about product quality) and reputable from disreputable sellers (i e , uncertainty about seller credibility), buyers may choose not to participate in an auction This dual uncertainty contributes to a "lemons" market, in which the potential of purchasing poor-quality products from a disreputable seller drives buyers away from the market As a result, adverse selection could eventually drive good-quality items from the auction market and cause lemons problems (Akerlof 1970)

As Huston and Spencer (2002), Bajari and Hortacsu (2004), and Kazumori and McMillan (2005) note, the lemons problem stems from impersonal transactions and information asymmetry and may be the greatest obstacle to the rapid growth of Internet auction marketplaces Despite their soaring popularity, Internet auctions remain far from mainstream e-commerce outlets According to Forrester Research (Johnson and Hult 2008), only one-third of North American households with Internet connections made an auction purchase in 2004 Many consumers voice concerns about trust and safety issues associated with Internet transactions (Pinker, Seidmann, and Vakrat 2001), fueled by reports of product misrepresentation, delivery failures, fee stacking, black-market goods, and so forth [1] In 2006, the Internet Crime Complaint Center (IC3 [a partnership between the Federal Bureau of Investigation and National White Collar Crime Center]) received approximately 207,492 Internet fraud complaints, with total losses from these complaints exceeding $198 44 million, and Internet auction fraud was the top complain on the list (IC3 2006)

Therefore, to attract more users to an auction site or a particular auction, Internet auction companies and sellers must address an important question What is the best auction design to mitigate uncertainty and attract more bidders? Since the emergence of the Internet, Internet auction companies have continued to develop innovative institutional features that enable sellers to reveal more information about their credibility and product quality to potential buyers For example, in 2001, sellers were given the option to post multiple pictures to eBay, for a fee, to provide more visual

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[1] Buyer-related fraudulent activities, such as nonpayment, triangulation, multiple bidding, and shield bidding, also exist, however, we study how sellers' quality indicators help mitigate buyers' concerns and affect bidding decisions We leave the study of how to improve auction designs to overcome buyers' fraudulent problems to further research

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information about their listed products. Sellers are also allowed to specify a minimum bid (i.e., the smallest amount that can be bid for a specific auction) or a reserve price, which remains hidden from bidders but must be exceeded before the seller is required to sell. In 2002, eBay instituted the buy-it-now (BIN) option, which further allowed sellers to specify the exact price at which they were willing to sell their products immediately. Acquired by eBay in 2002, PayPal offers eBay buyers coverage of up to $2,000 for claims of nondelivery or significant misrepresentation. Thus, sellers can adopt a third-party payment system to reduce the risks associated with the transaction. Most Internet auction companies offer a feedback system that enables both sellers and buyers to rate each other according to their performance. The cumulative rating points are displayed next to the participant's name, along with all previous comments from other users.

As an important format for electronic commerce, the rapid development of Internet auctions demands additional research to understand how such innovative auction features affect consumer participation and bidding decisions and the implications for solving the lemons problem. As Chakravarti and colleagues (2002) and Herschlag and Zwick (2002) assert, research should investigate how the design of Internet auction mechanisms or institutional features influence bidding behavior and price and revenue outcomes.

Existing auction research in marketing and economics literature centers on modeling bidders' specific behaviors, such as late bids (Ockenfels and Roth 2006, Roth and Ockenfels 2002), sale prices (Ariely and Simonson 2003, Bajari and Hortacsu 2003, Dholakia 2005), reactions to minimum bids (Borle, Boatwright, and Kadane 2005, Kamins, Drèze, and Folks 2004, Lucking-Reiley 1999), willingness to pay (Bradlow and Park 2007, Nunes and Boatwright 2004, Park and Bradlow 2005), reactions to the BIN option (Budish and Takeyama 2001, Wang, Montgomery, and Srinivasan 2004), and bidder heterogeneity in bidding strategies (Sinha and Greenleaf 2000, Wilcox 2000).[2] To the best of our knowledge, little research has empirically investigated how innovative auction features affect bidders' decisions when they suffer from information asymmetry or has evaluated whether current Internet auction designs help alleviate the lemons problem.

In this article, we recognize the dual information asymmetry and separate all observed Internet auction features into potential direct product quality indicators, indirect product quality indicators, and seller credibility indicators. We draw from signaling theory (Akerlof 1970, Milgrom and Roberts 1982, Spence 1973) to develop a typology of most currently observed Internet auction features and examine their potential signaling roles. On the basis of signaling and auction theory (Bajari and Hortacsu 2004, Milgrom and Weber 1982, Rothkopf 1969, Wilson 1969), we hypothesize that different auction features affect bidders' interdependent decisions, such as whether to participate, who bids, when to bid, and how much to bid. Using field data collected from eBay auctions, we test the hypotheses by applying a modification of Park and Bradlow's (2005) model, implemented in a hierarchical Bayesian framework, to describe consumers' dynamic bidding behavior in the form of latent competition within auctions (Ariely and Simonson 2003, Bajari and Hortacsu 2004).[3]

Our empirical results show that quality indicators that directly reveal information on product quality and seller credibility (e.g., multiple picture postings, money-back guarantee, seller's cumulative rating, third-party payment method) encourage bidders not only to participate but also to shade bids. The opposite is true for indirect quality indicators (e.g., minimum starting bid, hidden reserve price, the BIN option), which discourage participation but increase bidding amount. We further demonstrate that the simultaneous use of quality indicators and seller credibility indicators (e.g., seller's rating, third-party payment) strengthens the effects of quality indicators. More experienced consumers tend to make better inferences about the roles of both credibility and quality indicators. On the basis of these estimation results, we run a simulation to examine how bidding decisions may change when the auction features appear more frequently. Overall, the signaling-based hypotheses are consistent with both the estimation and the simulation results and provide coherent explanations of consumers' bidding behavior.

Although previous studies have documented quality signaling as a solution for information asymmetry (e.g., Anderson and Simester 2001, Balachander and Srinivasan 1994, Chu 1992, Desai 2000, Desai and Srinivasan 1995, Kalra and Li 2008, Kirmani and Rao 2000, Moorthy and Srinivasan 1995, Soberman 2003, Spence 1973, Srinivasan 1991, Wernerfelt 1988), we find no empirical tests of general signaling theory in an Internet auction setting (cf. Dewally and Ederington 2006). Therefore, our research attempts to fill this gap by recognizing dual information uncertainties and investigating whether the current design of Internet auctions helps increase trust among buyers and sellers and alleviate the lemons problem. In doing so, we also shed light on the evaluation of auction designs.

Research Hypotheses

In this section, we first classify commonly observed auction features into possible direct quality indicators, indirect quality indicators, and seller credibility indicators. We then proceed to determine whether each classification qualifies as a signaling tool, and we predict how each might affect bidders' decisions, such as whether to bid, how much to bid, and when to bid.

Classification of Auction Features

In the first column of Table 1, we list the major auction features that many online auction houses adopt. The adoption of multiple picture postings enables the seller to reveal directly more visual information about the product. Speci-

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[2] For a comprehensive review of Internet auctions, see Bajari and Hortacsu (2004) and Baker and Song (2007).

[3] When we collected our data in 2001, features such as product or seller certification were not yet available. Thus, our empirical analysis is applied to a subset of the indicators that we discuss in the "Research Hypotheses" section.

TABLE 1
Typology of Internet Auction Features

	Classification of Quality Indicators		Qualification as Signaling Device			Expected Effects on Bidding Behavior		
			Signaling Cost		Single-Crossing Property			
Auction Features	**Uncertainty**	**Type of Indicator**	**Upfront**	**Future**		**Entry**	**Time**	**Amount**
Possible Direct Quality Indicators								
Picture postings	Product quality	Direct	Yes	No	Yes	+	–	–
Money-back guarantee			No	Yes	Yes	+	–	–
Certification of product			Yes	No	Yes	+	–	–
Product description			No	No	No	N A[a]	N A	N A
Possible Indirect Quality Indicators								
Minimum bid	Product quality	Indirect	Yes	Yes	Yes	–	–	+
Hidden reserve price			Yes	Yes	Yes	–	–	+
BIN option			Yes	Yes	Yes	–	–	+
Possible Seller Credibility Indicators								
Seller's rating	Seller credibility	Direct	No	Yes	Yes	+	–	–
Third-party payment			No	Yes	Yes	+	–	–
Certification of seller			Yes	No	Yes	+	–	–
Credit card payment			No	No	No	N A	N A	N A
Escrow service			No	No	No	N A	N A	N A

[a] Predictions are not applicable to these auction features because they are not eligible to serve as quality indicators

fying a money-back guarantee reveals information about the seller's confidence in the product quality Certification of the auction item (e g , professional appraisal of baseball cards) demonstrates its true quality level Sellers may also disclose the condition or quality level of their auctioned items in the product description These four auction features directly reveal information about the quality of the auctioned products Thus, we label them as potential "direct quality indicators"

The minimum starting bid specifies the lowest bidding amount, and the hidden reserve price places a lower bound on the final sale price The BIN option spells out the price at which the seller is willing to sell the auctioned item and to end the auction immediately (Budish and Takeyama 2001) Therefore, these three features may reveal information about product quality as forms of price signals (Milgrom and Roberts 1982, Moorthy and Srinivasan 1995) Furthermore, they reveal the values imposed by the seller and thus indirectly provide information about the product quality We label these three auction features as potential "indirect quality indicators"

The seller's feedback rating, third-party payment, and certification of seller (i e , by an independent trade association) reveal information about the credibility of the seller and may increase the buyer's trust Adopting credit card payment methods and online escrow services may also increase the buyer's trust in both the seller and the transaction because buyers receive some fraud protection from the credit card issuers or the escrow service providers[4] Therefore, these auction features could potentially reveal direct information on a seller's credibility and thus are all potential direct indicators We label these as "seller credibility indicators"

Although these auction features contain information about product quality or seller credibility, they do not necessarily function as signaling devices As Spence (1973) and Kirmani and Rao (2000) note, two conditions must be met before features represent signaling devices First, it should be costly for the seller to adopt the signaling device, in the terminology of signaling literature, the device must induce signaling costs Second, the signaling costs must satisfy the single-crossing property that such costs are higher for "bad" sellers than for "good" sellers so that a separating equilibrium occurs In such equilibrium, consumers correctly infer the seller's true type on the basis of the different signaling strategies adopted

Next, we borrow the signaling theory that Spence (1973) proposes in the labor market context to examine whether each of these indicators satisfies the two conditions, and we rely on both signaling and auction theories to motivate and provide an analogy for the hypotheses, in which we predict how each of the indicators will affect consumer participation and other bidding decisions In the remainder of Table 1, we summarize the qualification status and predicted direction of each indicator's influence on whether, when, or how much to bid

Direct Quality Indicators

The signaling costs of posting additional pictures equal the fixed fees the seller pays up front, as well as the sunk costs of any associated photography and/or scanning equipment (Dewally and Ederington 2006) For example, eBay charges a nonrefundable fee of $ 15 for each additional picture after the first picture posting Because multiple picture postings require nonrefundable costs, regardless of a sale, low-quality sellers are less likely to incur that cost, especially because multiple pictures may just reveal the true (poor) quality of the product Thus, it is more costly for low-quality sellers to adopt this tool (Desai 2000, Kalra and Li 2008, Moorthy and Srinivasan 1995), and consumers can rely on this indicator to separate high-quality from low-quality products

Sellers can specify a money-back guarantee in the product description section Because it is usually not enforced by most Internet auction companies, sellers do not need to pay any fee for their verbal promise However, this option incurs some future cost because of the existence of the IC3, which handles disputes between sellers and buyers (Lutz 1989) That is, the signaling cost results from the potential future refund (Moorthy and Srinivasan 1995) Because low-quality products have higher return rates, it is more expensive for sellers with low-quality products to adopt money-back guarantees

Certifying auctioned items can also require significant seller costs For example, Dewally and Ederington (2006) note that it typically costs the seller $20–$55 to have a comic book certified by Comics Guaranty, and according to Jin and Kato (2006), professional grading of baseball cards costs $6–$20 per card when performed by the Professional Sports Authenticator or Beckett Grading Service These certification costs represent nonrefundable, upfront signaling costs Both studies show that the certification of auctioned items satisfies the single-crossing property because a low-quality product is less likely to earn a high rating

Sellers may disclose quality-related information (e g , a condition that excludes a money-back guarantee) about the auctioned item in the product description However, this information disclosure is "cheap talk" and does not incur any cost to the seller (Baker and Song 2007, Jin and Kato 2006) Therefore, it does not qualify as a signaling device

In summary, multiple picture postings, money-back guarantees, and product certification not only incur signaling costs but also satisfy the single-crossing property, which qualifies them to serve as signaling devices Next, we discuss how these tools can affect bidding decisions

Whether to bid Intuitively, posting multiple pictures, offering money-back guarantees, and certifying products should offer bidders more information about the product and signal its quality With more information, consumers should be more likely to participate in the auction (Gilkeson and Reynolds 2003, Ottaway, Bruneau, and Evans 2003) Therefore, we expect that direct quality indicators encourage consumers to participate in auctions

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[4] Companies offering genuine escrow services provide a form of secure payment mechanisms that enable buyers to escrow payments until they have inspected, approved, and accepted the delivered merchandise Online escrow services protect the interests of buyers against fraud and the risk of nonperformance They usually are paid for by the buyers and appear in high-value transactions As a relatively new feature, eBay recommends using escrow guarantees provided by Escrow com for merchandise worth $500 or more

How much and when to bid Knowing how the quality indicators affect bidders' bidding amount (how much to bid in each bidding occasion) and bidding time (when to submit each bid) during the course of an auction is also important Unlike private-value auctions, in which the bidder knows the value of the item with certainty and his or her valuation is independent of other bidders' valuations (Vickrey 1961), a bidder's valuations of a product can depend on the preferences of others in an Internet auction (Milgrom and Weber 1982) As Bajari and Hortacsu (2003) and Milgrom and Weber (1982) indicate, when bidders are uncertain about their own evaluations of a product, auctioned items may have an affiliated value that can be affected by other bidders Recent empirical work (Dholakia and Soltysinski 2001, Gilkeson and Reynolds 2003) supports the view that the affiliated-value model is the most descriptive type of Internet auctions When buyers decide how much to bid for a product, they are likely to rely on the bidding behavior of other bidders to form their willingness-to-pay amount For example, speculative investors who buy for future resale are likely to adjust their bidding amount according to the observed bidding prices submitted by other bidders Early bids transmit information about the item's value to competitive bidders and may drive up the final winning price In turn, too many bidders or too frequent early bids may create the winner's curse, such that the winner of the auction overbids or pays a higher price than the true value of the item (Thaler 1988)

Bidders are rational (Bajari and Hortacsu 2003, Ockenfels and Roth 2006), such that when they expect more bidders to be attracted by the use of quality indicators, they realize the increase of the affiliated value of the product and the potential winner's curse Several studies of Internet auctions (i e , Bajari and Hortacsu 2003, Jin and Kato 2006, Yin 2006) show that when they anticipate more bidders, rational bidders strategically shade their bids by reducing the amount they submit on each bidding occasion Specifically, Bajari and Hortacsu (2003) show that buyers of collectable coins bid 10% less than their own private signals to compensate for the winner's curse Adding another bidder reduces those equilibrium bids by 3 2% Similarly, Yin (2006) finds that the bidding strategy in the common value second-price auction model responds negatively to an increase in the variance of the bidder's private valuation Therefore, we expect that consumers reduce their bidding amount during the course of the bidding process when they observe the use of direct quality indicators

Auction theory further indicates that in auctions with common value, it is in the bidders' best interests to bid as infrequently and/or as late as possible (Bajari and Hortacsu 2003, Ockenfels and Roth 2006) This is because more frequent or earlier bids increase the common value of other bidders or the chances of a bidding war However, the use of direct quality indicators reduces information asymmetry, which may make consumers less likely to depend on other bidders' bidding information and encourage them to bid their maximum value earlier in affiliated-value auctions Furthermore, according to Rasmusen (2001), late bidding occurs because bidders suffer uncertainty about their valuation for an item and want to economize the costs of acquiring information In contrast, with more complete information about a product, bidders bid earlier Therefore, we predict that the use of direct quality indicators encourages early bidding

> H_1 Direct quality indicators (e g , multiple picture postings, money-back guarantees, product certification) encourage bid participation, decrease bidders' bidding amount, and encourage bidders to bid early

Indirect Quality Indicators

Indirect quality indicators, such as minimum starting bid, hidden reserve price, and BIN price, may experience two types of signaling costs The first type entails the publicly visible, nonrefundable fees the seller pays that are independent of the sale of the auctioned item For example, eBay charges nonlinearly increasing insertion fees to the seller according to the amount of the minimum starting bid, with a maximum of $4 80 (i e , $ 30 to set the starting bid between $ 01 and $ 99, $ 35 for starting bids between $1 00 and $9 99, and so on) In addition, eBay charges a reserve fee of either $ 50 or $1 00 for the use of a hidden reserve price, which may be refunded if the item sells at a price higher than the reserve price The use of the BIN price on eBay costs the seller a fixed amount of $ 05

The second type of signaling costs includes the potential loss of revenue when minimum starting bids and hidden reserve prices screen out consumers with low willingness to pay Wang, Montgomery, and Srinivasan (2004) demonstrate that the BIN option may lower the chances of winning a bid and discourages bidders, especially those who are willing to bear participation costs As Bajari and Hortacsu (2003, 2004) show, having fewer participating bidders lowers the revenues Katkar and Reiley (2006) support this claim by noting that a high secret reserve price deters bidding and reduces both the likelihood of sale and the final bid amount

The sum of the two types of signaling costs is greater for low-quality sellers, which normally have lower marginal costs (Desai 2000, Kalra and Li 2008, Moorthy and Srinivasan 1995) Although the nonrefundable fees may be the same to both high-quality and low-quality sellers, the potential revenue loss will be higher for the low-quality seller because of the lower marginal costs That is, for each unit loss incurred by the high-quality seller that adopts these indicators, the low-quality seller must incur more than one unit of loss to mimic it (Moorthy and Srinivasan 1995) In this sense, the signaling role of such quality indicators is similar to that of traditional price signals, such that higher prices result in a loss of revenue for the high-quality seller that the low-quality seller must incur more of if it wants to mimic the high-quality seller (Milgrom and Roberts 1982, Moorthy and Srinivasan 1995) Therefore, the three possible indicators satisfy the single-crossing property and qualify as quality signaling devices

Whether to bid The use of minimum bids and hidden reserve prices should discourage consumers' participation by placing lower and higher bounds on their valuations, respectively (Budish and Takeyama 2001) Consumers with low valuations are screened from an auction with a lower bound, and the transaction will not occur if the upper bound is not met Furthermore, as Wang, Montgomery, and Srinivasan (2003) and Bajari and Hortaçsu (2003) argue, significant participation costs play important roles in bidders' decisions to participate in Internet auctions Because the reserve price is unknown to the bidders, they face higher participation costs and run the risk that sellers will withdraw the product, making their bidding efforts obsolete

Impatient sellers adopt the BIN option to avoid both the transactional and the monetary costs of the bidding process (Wang, Montgomery, and Srinivasan 2004) The BIN option mixes dynamic pricing with fixed pricing and tempts buyers to accept the fixed price without going through the bidding process Thus, it lowers the chance of winning a bid and discourages bidders, especially those who are willing to bear participation costs Therefore, in general, we predict that indirect quality indicators discourage auction participation

How much and when to bid In contrast to H_1, when consumers observe the use of indirect quality indicators and thus expect fewer participating bidders, they increase the bid amount with less concern about the potential winner's curse By revealing sellers' valuation of the product, indirect quality indicators help consumers form more accurate valuations (Bajari and Hortacsu 2004, Baker and Song 2007) With less uncertainty, bidders can be more deterministic about how much to bid and do not need to revise their bidding prices by observing competitive bids (Ariely and Simonson 2003) With more complete information about a product, bidders bid earlier (Rasmusen 2001) Therefore, we expect that indirect quality indicators encourage them to bid early

H_2 Indirect quality indicators (e g , minimum bid, hidden reserve price, the BIN option) discourage bid participation, increase bidders' bidding amount, and encourage early bidding

Seller Credibility Indicators

Long-term performance evaluations, such as feedback ratings, motivate sellers to be consistently truthful in their representations of product information and delivery (McDonald and Slawson 2002) A seller must devote time and effort to monitor and build up a reputation and to receive strong positive feedback from buyers after each transaction Again, the signaling costs are related to the future revenue at stake A poor reputation resulting from inconsistent signals results in lower future sales (Dholakia 2005, Dholakia and Soltysinski 2001, Gilkeson and Reynolds 2003, Houser and Wooders 2006, Lucking-Reiley 2000, Melnik and Alm 2002) In addition, because a low-credibility seller must incur more costs to attain the same reputation, the signaling costs are greater, so this feature satisfies the single-crossing property, and the seller's rating qualifies as a signaling device Ariely and Simonson (2003) argue that a seller's investment in feedback ratings is similar to that of brand reputation

Third-party payment methods (i e , PayPal) offer secure online payments After an auction is completed, the winning bidder contacts the seller to pay for the auctioned item through Paypal, on which both the seller and the buyer open accounts (which is free) The seller ships the item to the buyer, and a signaling cost of the transaction fees is charged to the seller to receive payment from the buyer For example, PayPal charges 2 9% of the transferred funds plus $ 30 per transaction to the seller to receive payments from buyers in the United States when the seller's monthly sales fall between $0 and $3,000 Again, this signaling cost is a future cost that is applied at the end of the auction, it will be higher for a low-quality seller because it invokes a greater probability of disputes and being held accountable than for the high-quality seller Therefore, a third-party payment method qualifies as a signaling device

Similar to the signaling role of product certification, seller certification by an independent third party, such as a trade association, creates costs for the seller These signaling costs are higher for low-credibility sellers because the chance of obtaining a high ranking is lower than it would be for high-credibility sellers Therefore, seller certification provides another signaling device

In contrast, the adoption of credit card payment and/or online escrow services do not qualify as signaling tools, because these approaches do not cost the seller anything Thus, no signaling cost exists, though both methods could provide some protection to the buyer

Whether, how much, and when to bid In Internet auctions, the seller's credibility is related to the delivery of the product and the accuracy of the product description For reasons similar to those we pose regarding direct quality indicators, we posit that seller credibility indicators encourage consumers to participate and bid early However, because the use of such indicators may result in more bidders, it also may decrease bidders' willingness to bid (WTB) (Bajari and Hortacsu 2003, Jin and Kato 2006, Yin 2006)

H_3 Seller credibility indicators (e g , seller rating points, third-party payment, seller certification) encourage bid participation, decrease bidders' bidding amount, and encourage bidders to bid early

Although sellers can adopt Internet auction features to signal product quality, bidders can question the credibility of these indicators Sellers are motivated to send false indicators if the (short- and long-term) cost of sending such signals is lower than the price premium (Jin and Kato 2006) The cumulative rating system developed by eBay reveals the degree of consistency between the sellers' signals and the quality and delivery of all the products they have sold (McDonald and Slawson 2002) Thus, buyers can rely on the historical performance of the sellers to make inferences about the credibility of their indicators Higher seller ratings imply higher consistency between sellers' signals and the true quality of their products All else being equal, the signals sent by sellers with higher ratings can be deemed to be truer than those from sellers with lower ratings Similarly, the use of third-party payment methods and seller certification may increase consumers' trust because their payment is secure and the seller must pay a transaction fee to receive the funds from the buyer, whereas a PayPal account is free for the buyer (Gilkeson and Reynolds 2003) In addition, PayPal offers eBay buyers coverage of up to $2,000 for claims of nondelivery or significant misrepresentation All PayPal transactions also are covered by 100% protection against unauthorized payments from the buyer's account Therefore, seller credibility indicators, such as seller rating points, third-party payment, and seller certification, should amplify the effect of quality indicators (both direct and indirect) on consumer bidding behavior More specifically, the simultaneous use of seller credibility and product quality indicators amplifies the signaling effect

H_4 Seller credibility indicators (e g , seller rating points, third-party payment, seller certification) amplify the effects of quality indicators

Thus, seller credibility indicators play dual roles They provide verifiable information about the seller's credibility or reputation, and they may lend credibility to other product quality–related auction features Note that we are not interested in the intraindicator-type amplification because, as Kirmani and Rao (2000) show, if one signal has already revealed the true quality, another signal of the same type is unnecessary

Impact of Bidder Experience

Empirical analysis reveals that when an Internet auction starts, some bidders lack knowledge about the auction format, and the impact of bidders' experience on their decisions is significant in Internet auctions For example, Wilcox (2000) shows that more experienced bidders bid later than less experienced bidders Experimental studies also demonstrate that inexperienced bidders tend to overbid and suffer from the winner's curse (Bajari and Hortacsu 2004, Kagel and Roth 1995, Wilcox 2000) For example, online chat rooms often feature experienced bidders reminding other bidders to pay attention to feedback Bidders with more experience may understand the auction mechanism and signaling roles of indicators better than less experienced bidders New to Internet auctions, inexperienced bidders are still learning about the design of the bidding system and the economic functions of indicators Therefore, we expect that the impact of quality and credibility indicators on bidding decisions will be greater for more experienced bidders

H_5 The effects of indicators in H_1–H_4 are stronger for experienced bidders

Model

To test our hypotheses, we adopt and modify Park and Bradlow's (2005) model, which entails a general integrated statistical framework that captures consumers' dynamic bidding behavior within auctions using a multistage process The integrated model of bidding behavior includes four key components (1) whether consumers participate in an auction, (2) if so, who bids or becomes the actual observed bidder at a particular bidding occasion, (3) when the bid takes place, and (4) how much the consumer bids during the entire sequence of bids in the auction The key latent construct that integrates all four modules is consumers' WTB at each bidding occasion Thus, the framework incorporates consumers' endogenous entry and competition among potential bidders, including those not directly observed in the auction We account for consumer heterogeneity with a hierarchical Bayesian framework In summary, the integrated modeling framework enables us to examine how different quality/credibility indicators affect bidders' WTB and their bidding decisions

A Consumer's WTB

A consumer's WTB is a time-varying stochastic valuation that can be updated for a particular item over the course of the auction and can change from one bidding occasion to another because the consumer's affiliated valuation of the auctioned item may vary according to the actions of other bidders (Ariely and Simonson 2003) Intuitively, a consumer's WTB should be determined by perceived seller credibility and product quality, as well as the auction and bidder characteristics (Bradlow and Park 2007, Chan, Kadiyali, and Park 2007) Let WTB^r_{ijm} represent bidder i's WTB for auction j in product category m at the rth round of bidding More formally, we model consumer's WTB^r_{ijm} as follows

$$\text{(1)}\qquad \mathrm{WTB}^r_{ijm} = \beta_{im0} + \mathbf{C}_{ijm} + \mathbf{Q}_{ijm} + \boldsymbol{\beta}'_{i1}\mathbf{X}^r_{jm} + \phi_j + \eta^r_{ijm}$$

Thus, $\mathbf{C}_{ijm}$ and $\mathbf{Q}_{ijm}$ are consumers' perceptions of seller credibility and product quality, respectively, which are unobservable However, without directly observing the product or seller, bidders can assess the seller's credibility and the product's quality using cues (auction features) on the site On the auction site, consumers can observe public information published by the seller, including the seller's rating points ($\mathrm{SRATING}_{jm}$), third-party payment ($\mathrm{THIRDPAY}_{jm}$), multiple picture postings ($\mathrm{PICTURE}_{jm}$), money-back guarantees (MONEY_{jm}), minimum bids (MBID_{jm}), reservation prices ($\mathrm{RESERVE}_{jm}$), and BIN options ($\mathrm{BUYITNOW}_{jm}$) (Note that we collected our empirical data in 2001, and at that time, the use of product or seller certification was not yet available) Therefore, we assume that consumers form perceptions about seller credibility and product quality according to the following equations

$$\text{(2)}\qquad \mathbf{C}_{ijm} = \phi_{i1}\mathrm{SRATING}_{jm} + \phi_{i2}\mathrm{THIRDPAY}_{jm}, \text{ and}$$

$$\begin{aligned}\text{(3)}\qquad \mathbf{Q}_{ijm} = {} & \phi_{i3}\mathrm{PICTURE}_{jm} + \phi_{i4}\mathrm{MONEY}_{jm} + \phi_{i5}\mathrm{MBID}_{jm}\\ & + \phi_{i6}\mathrm{RESERVE}_{jm} + \phi_{i7}\mathrm{BUYITNOW}_{jm}\\ & + \phi_{i8}\mathrm{SRATING}_{jm} \times \mathrm{PICTURE}_{jm}\\ & + \phi_{i9}\mathrm{SRATING}_{jm} \times \mathrm{MONEY}_{jm}\\ & + \phi_{i10}\mathrm{SRATING}_{jm} \times \mathrm{MBID}_{jm}\\ & + \phi_{i11}\mathrm{SRATING}_{jm} \times \mathrm{RESERVE}_{jm}\\ & + \phi_{i12}\mathrm{SRATING}_{jm} \times \mathrm{BUYITNOW}_{jm}\end{aligned}$$

$$
\begin{aligned}
&+\phi_{i13}\text{THIRDPAY}_{jm} \times \text{PICTURE}_{jm}\\
&+\phi_{i14}\text{THIRDPAY}_{jm} \times \text{MONEY}_{jm}\\
&+\phi_{i15}\text{THIRDPAY}_{jm} \times \text{MBID}_{jm}\\
&+\phi_{i16}\text{THIRDPAY}_{jm} \times \text{RESERVE}_{jm}\\
&+\phi_{i17}\text{THIRDPAY}_{jm} \times \text{BUYITNOW}_{jm}
\end{aligned}
$$

As we discussed previously, sellers' cumulative rating points and use of third-party payments may convey information about seller credibility and relate directly to product delivery We include multiple picture postings, money-back guarantee, minimum bid, reservation price, and BIN option in the perceived quality component because they may signal product quality under information asymmetry Recall our discussion that sellers' rating points and third-party payment not only are credibility indicators themselves but also determine the effectiveness of the other quality indicators We include the interaction terms of seller rating points and third-party payment with the other quality indicators to capture whether the seller credibility indicators amplify the effectiveness of the product quality indicators[5] We also examine the correlation of the independent variables in Equations 2 and 3 and find that the correlations are low (i e , the highest is equal to 45) Therefore, multicollearity is not a concern for our model

The quality/credibility indicators we investigate usually are set at the beginning of the bidding process, before the bidder's participation or bidding decisions are revealed, and do not change across bidding occasions To account for the time-varying factors that affect WTB during the course of the bidding, we follow Park and Bradlow (2005) and include bid-specific characteristics at any particular bidding occasion The term $\mathbf{X}^r_{jm}$ is a vector of covariates for the rth bid-specific and auction-specific characteristics in auction j in product category m, including the following exogenous variables (1) length of auction duration (BIDDAY_{jm}), (2) whether the rth bid occurs on a weekend (WEEKEND^r_{jm}), (3) the time remaining until the end of the auction (REMAIN^r_{jm}), (4) the number of bids submitted before the rth bid (NUMBID^r_{jm}), (5) the bid rate, defined as (r – 1) divided by the total elapsed time (BIDRATE^r_{jm}), and (6) the rate of bid increments, determined as the incremental bid amount in the previous round divided by its elapsed time (AMTRATE^r_{jm}) These variables affect the bidder's WTB or the bidding amount as control variables (Baker and Song 2007, Park and Bradlow 2005) The inclusion of NUMBID^r_{jm} enables us to test whether bidders vary their bidding decisions according to the bidding behavior of other bidders or the existence of affiliated value in Internet auction The error term φ_j captures unobserved auction-specific characteristics that affect WTB, which we assume are independently and identically distributed across bidders, $\varphi_j \sim N(0, \sigma^2_\varphi)$, and η^r_{ijm} captures the unobserved variation affecting WTB and varying with bidder, auction, and product with the i i d distribution $\eta^r_{ijm} \sim N(0, \sigma^2_\eta)$

In Equation 1, β_{im0} represents consumer i's intrinsic WTB for product category m, after we control for the idiosyncratic differences across product categories The 17 × 1 parameter vector $\Phi_i = (\phi_{i1}, \phi_{i2}, \quad , \phi_{i17})'$ captures the impacts of various indicators on bidders' WTB Specifically, ϕ_{i1-2} measure the effectiveness of the credibility indicators with regard to WTB, ϕ_{i3-7} measure the main effects of the quality indicators on WTB, and ϕ_{i8-17} indicate the effects of sellers' reputation and third-party payment on the credibility of each quality indicator The term β_{i1} is a 6 × 1 vector of parameters that measures the effects of the control variables on WTB

Park and Bradlow (2005) use the latent construct of WTB as the core of their proposed model of online bidding behavior that determines the consumer's bid speed, which in turn governs the decisions about whether to bid, who bids, when to bid, and how much to bid Specifically, bid speed, d^r_{ijm}, of potential bidder i at bid occasion r in auction j in product category m follows an exponential distribution Ariely and Simonson (2003) show that consumers' value assessment and decision dynamics differ in the entry stage compared with during the auction Therefore, we allow the consumer's WTB to have a different impact on the bid speed in different decision stages, as well as on the consumer's decisions about whether to bid, who bids, and when to bid (i e , d^r_{ijmk}, where k = 1, 2, or 3, representing decisions whether to bid, who bids, and when to bid, respectively) Formally,

$$d^r_{ijmk} \sim \lambda^r_{ijmk} \times \exp[-\lambda^r_{ijmk} \times (t^r_{ijm} - t^{r-1}_{jm})], \tag{4}$$

where

$$\log(\lambda^r_{ijmk}) = \alpha_{k0} + \alpha_{k1}(\text{WTB}^r_{ijm} - \text{BID}^{r-1}_{jm}) + \varepsilon^r_{ijmk}, \tag{5}$$

$$\varepsilon^r_{ijmk} \sim N(0, \sigma^2_\varepsilon)$$

In this equation, t^r_{ijm} is potential bidder i's bidding time at bid occasion r in auction j in product category m, as we explain subsequently Let t^{r-1}_{jm} and BID^{r-1}_{jm} denote the observed bidding time and observed bidding amount in the previous bid occasion (r – 1) in auction j in product category m, respectively The mean of the bidding speed equals $E(d^r_{ijmk}) = 1/\lambda^r_{ijmk}$, given the exponential distributional assumption Intuitively, Equations 4 and 5 note that bidder i's bidding speed at bid occasion r for item j in product category m is determined by the bidding surplus for item j (i e , $\text{WTB}^r_{ijm} - \text{BID}^{r-1}_{jm}$) because the bidder's WTB must be greater than the observed bidding amount in the previous round if the bidder is to participate in the current bid In turn, α_{k0} and α_{k1} measure the bidder's intrinsic rate of bidding speed and the impact of the bidding surplus on the bidding speed, respectively If α_{k1} is negative, higher bidding surplus increases bidding speed—that is, given $E(d^r_{ijmk}) = 1/\lambda^r_{ijmk}$

The expectation of bidding speed is the inverse of λ^r_{ijmk}, which is determined by the bidding surplus (i e , WTB^r_{ijm} –

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[5] We include the interaction term between SRATING_{jm} (or THIRDPAY_{jm}) and other quality indicators to test H_4 We also tried some other interaction terms, such as $\text{PICTURE}_{jm} \times \text{MONEY}_{jm}$, however, many of them were not significant Therefore, we do not include them in the proposed model

BID^{r-1}_{jm}) Therefore, the impacts of quality or credibility indicators on the bidder's bidding speed can be captured by the reverse sign of $\alpha_{k1} \times \Phi_i$ for k = 1, 2, and 3, where vector Φ_i refers to the impact of quality/credibility indicators on WTB as in Equations 2 and 3 Intuitively, bidding speed captures the bidder's urgency By incorporating the bidder's perceptions of seller credibility and product quality, we can investigate the potential effects of these indicators on bidding behavior (Bradlow and Park 2007, Chan, Kadiyali, and Park 2007, Park and Bradlow 2005)

Whether an Auction Receives a Bid

Many listed auctions result in no participation, so we assume that whether an auction receives a bid depends on whether the lowest bidding time (i e , $\min[t^1_{ijm}]$) of all potential bidders at the first potential bid lies within the auction duration We use $I^{r=1}_{jm}$ to represent the number of potential bidders for item j in product category m during round 1 and T_{jm} to denote the length of auction j in product category m In other words, the probability that auction j ends with no bidders equals the probability that the lowest bidding time ($\min[t^1_{ijm}]$) for all $i \in I^{r=1}_{jm}$ exceeds the auction duration T_{jm} The minimum of a set of exponentials is exponentially distributed with the rate equal to the sum of the rates, so the probability that auction j in product category m receives no bids over its whole T_{jm} duration is

$$(6) \qquad \mathrm{pr}\left[\min(t^1_{ijm}) > T_{jm}\right] = \exp\left[-\left(\sum_{i=1}^{I^{r=1}_{jm}} \lambda^1_{ijm}\right) \times T_{jm}\right]$$

The probability that auction j attracts at least one bidder (i e , $WBID_{jm} = 1$) is

$$(7) \qquad \mathrm{prob}(WBID_{jm} = 1) = 1 - \mathrm{pr}\left[\min(t^1_{ijm}) > T_{jm}\right]$$
$$= 1 - \exp\left[-\left(\sum_{i=1}^{I^{r=1}_{jm}} \lambda^1_{ijm}\right) \times T_{jm}\right]$$

That is, the entry probability for consumer i in auction j is related positively to the consumer's bid rate λ^1_{ijm} from Equation 7, and we can test the impacts of credibility or quality indicators on a consumer's entry decisions with the sign of $\alpha_{11} \times \Phi_i$

Who Bids

Next, we model whose bids we observe during round r out of the I^r_{jm} latent bidders in auction j According to Equations 4 and 5, the consumer's bidding speed follows an exponential distribution with the rate determined by his or her WTB Therefore, at each bidding occasion r, intuitively consumers are engaging in an exponential race that matches rates related to their WTB, and the person with the shortest time wins as the actual bidder at the rth bid Of the I^r_{jm} latent bidders at bid r in auction j in product category m, the bidder becomes the person with the shortest bidding time within the time interval [t^{r-1}_{jm}, T_{jm}] with a probability of

$$(8) \qquad \mathrm{pr}\left[\min(t^r_{ijm}) = t^r_{jm} \mid t^{r-1}_{jm} < \min(t^r_{ijm}) \le T_{jm},\ \forall i \in I^r_{jm}\right]$$
$$= \frac{\lambda^r_{ijm}}{\displaystyle\sum_{\substack{i=1 \\ i \ne i^{r-1}}}^{I^r_{jm}} \lambda^r_{ijm}}$$

A person cannot bid twice in a row or outbid him- or herself in Internet auctions, therefore, we remove the rate of bid speed by the previous bidder from the denominator in Equation 8 In addition, in the bid speed race, the observed bidder at bid r must be in the race by definition, so his or her WTB must be truncated below the outstanding bid Note that the inequality in Equation 8 enables the bidders to bid before or right on the ending time of an auction The bid probability for consumer i in auction j in product category m at bid r is related positively to the consumer's bid rate λ^r_{ijm} Therefore, we can test the impacts of credibility or quality indicators on a consumer's competitive entry or participation decisions at bid r according to the sign of $\alpha_{21} \times \Phi_i$

When to Bid

At each bidding occasion r, the bidder as the winner of the aforementioned exponential race has the shortest bidding time Therefore, conditional on who has submitted a bid, the bidding time at bid r is the minimum order statistic of the bid speeds of the I^r_{jm} latent bidders The probability of observing t^r_{jm} is given by

$$(9) \qquad \mathrm{pr}\left[\min(t^r_{ijm}) - t^{r-1}_{jm} = \Delta t^r_{jm} \mid t^{r-1}_{jm} < \min(t^r_{ijm}) = t^r_{jm} \le T_{jm}, \forall i \in I^r_{jm}\right]$$
$$= \frac{\displaystyle\sum_{\substack{i=1 \\ i \ne i^{r-1}}}^{I^r_{jm}} \lambda^r_{ijm} \times \exp\left(-\sum_{\substack{i=1 \\ i \ne i^{r-1}}}^{I^r_{jm}} \lambda^r_{ijm} \times \Delta t^r_{jm}\right)}{1 - \exp\left[\displaystyle\sum_{\substack{i=1 \\ i \ne i^{r-1}}}^{I^r_{jm}} \lambda^r_{ijm} \times (T_{jm} - t^{r-1}_{jm})\right]}$$

Because the bidding time of bidder i at bid r is the minimum order statistic of the bid speeds among the I^r_{jm} latent bidders, conditional on who has bid, the when-to-bid probability is related negatively to the consumer's bid rate λ^r_{ijm} from Equation 9 Therefore, the impacts of the credibility or quality indicators on a consumer's bidding time decisions at bid r are related negatively to the sign of $\alpha_{31} \times \Phi_i$

How Much to Bid

Let AMT^r_{ijm} represent the latent bidding amount at bid r for auction item j in product category m Thus, the latent bidding amount should be determined by WTB before this moment, following a normal distribution with mean WTB^r_{ijm} and variance σ^2_ξ

$$(10) \qquad AMT^r_{ijm} = WTB^r_{ijm} + \xi^r_{ijm},\quad \xi^r_{ijm} \sim N(0, \sigma^2_\xi)$$

Let b^r_{jm} denote the observed bid amount at the rth bid in auction j in product category m When an auction offers a BIN option with a prespecified price BIN_{jm}, the bidding process terminates if some bidders exercise the option In other words, when the bidding amount AMT^r_{ijm} is greater than the BIN asking price BIN_{jm}, bidder i can either end the auction by bidding BIN_{jm} or continue it by bidding less than BIN_{jm} To determine whether BIN_{jm} is exercised in auction j when AMT^r_{ijm} is greater than BIN_{jm}, we denote p^r_{ijm} as the probability of bidding BIN_{jm} and model it in a logit framework

$$p^r_{ijm} = \frac{\exp\left[\delta_0 + \delta_1(WTB^r_{ijm} - b^{r-1}_{jm})\right]}{1 + \exp\left[\delta_0 + \delta_1(WTB^r_{ijm} - b^{r-1}_{jm})\right]}, \tag{11}$$

where δ_0 and δ_1 are coefficients to be estimated The impacts of credibility or quality indicators on the consumer's decisions to bid the BIN and end the auction are related positively to the sign of $\delta_1 \times \Phi_i$

Note that p^r_{ijm} is a conditional probability of bidding BIN_{jm}, given that AMT^r_{ijm} is greater than BIN_{jm} If the opposite is true (i e , $AMT^r_{ijm} < BIN_{jm}$), in an auction with BIN_{jm} price, bidder i's bid amount is truncated by BIN_{jm} Finally, in auctions without a BIN price, bidder i can choose any level of bid amount based on his or her WTB

Taking all these cases into account, we model the bidder's bid amount as follows

$$\text{(12)}\quad pr(AMT^r_{ijm} = b^r_{jm})$$
$$= \begin{cases} \text{I} & \left[pr(AMT^r_{ijm} \geq BIN_{jm})\right] \times (p^r_{ijm}) \\ \text{II} & \left[pr(AMT^r_{ijm} \geq BIN_{jm})\right] \times (1 - p^r_{ijm}) \\ & \times\left[\phi\left(b^r_{jm}, b^{r-1}_{jm}, BIN_{jm} | WTB^r_{ijm}, \sigma^2_\xi\right)\right] \\ \text{III} & \left[pr(AMT^r_{ijm} < BIN_{jm})\right] \\ & \times\left[\phi\left(b^r_{jm}, b^{r-1}_{jm}, BIN_{jm} | WTB^r_{ijm}, \sigma^2_\xi\right)\right] \\ \text{IV} & \left[\phi\left(b^r_{jm}, b^{r-1}_{jm} | WTB^r_{ijm}, \sigma^2_\xi\right)\right] \end{cases},$$

where $\phi(b^r_{jm}, b^{r-1}_{jm}, BIN_{jm}|WTB^r_{ijm}, \sigma^2_\xi)$ is the normal density with mean WTB^r_{ijm} and variance σ^2_ξ, truncated at b^{r-1}_j from below and BIN_{jm} from above, and $\phi(b^r_{jm}, b^{r-1}_{jm}|WTB^r_{ijm}, \sigma^2_\xi)$ is the truncated normal density with mean WTB^r_{ijm} and variance σ^2_ξ, truncated below by b^{r-1}_{jm} Note that there are four cases in Equation 12 Cases I and II represent bids when AMT^r_{ijm} is greater than BIN_{jm}, Case III refers to a bid when AMT^r_{ijm} is lower than BIN_{jm}, and Case IV deals with a bidder's decision about how much to bid in auctions without a BIN price Moreover, Φ_i directly measures the impact of quality or credibility indicators on the consumer's bidding amount, given Equation 10

In summary, the mechanism of how various quality/credibility indicators affect consumers' bidding decisions proceeds as follows First, the indicators directly determine the consumer's WTB at each bidding occasion according to Φ_i in Equations 1–3 Second, the consumer's WTB affects his or her bidding speed through α_{k1} (where k = 1, 2, or 3) in Equations 4 and 5 Third, consumers engage in bidding speed races in which their bidding speeds determine decisions of whether to bid, who bids, and when to bid Therefore, we measure the impacts of the indicators on these three bidding decisions by the product of α_{k1} and Φ_i for k = 1, 2, or 3, respectively Finally, conditional on who bids, the bidder's WTB determines his or her bidding amount at each bidding occasion because the consumer's bidding amount is mean centered on his or her WTB, as in Equation 10 The impact of the indicators on bidding amount is also directly measured by Φ_i

Unobserved Heterogeneity and Estimation

Wilcox (2000) demonstrates that experienced bidders are more likely to bid later than inexperienced ones To account for this heterogeneity (Allenby and Rossi 1999, Gonul and Srinivasan 1996), we write the coefficients in Equation 1 as functions of the participating bidders' experiences Let $\pi_i = (\Phi_i, \beta_i)'$ Thus

$$\pi_i = \gamma_0 + \gamma_1 BEXPER_i + \mu_i, \quad \mu_i \sim N(0, \sigma^2_\mu) \tag{13}$$

With the coefficient γ_1, we study how bidders' experiences modify the effect of credibility or quality indicators on bidding decisions The hierarchical structure we use to account for consumer heterogeneity differs from that of Park and Bradlow (2005), who specify consumer unobserved heterogeneity only in the intercept of the WTB function for simplicity

We directly model the latent competition among a varying number of potential bidders (I^r_{jm}) over the course of an auction To calculate I^r_{jm}, we use the number of potential bidders who have positive surplus (i e , $WTB^r_{ijm} > b^{r-1}_{jm}$) out of the maximal number of potential bidders (I_{jm}) for auction j in product category m We discuss how we approximate I_{jm} in the "Data Description" section To estimate the model, we also introduce a hierarchical Bayesian approach that accounts for unobserved heterogeneity (Allenby and Rossi 1999) We then apply the Markov chain Monte Carlo method (Gibbs sampler) and data augmentation with Bayesian Inference Using Gibbs Sampling (WinBUGS) software to estimate the model parameters We run two independent chains with 25,000 Markov chain Monte Carlo iterations each and discard the first 20,000 iterations as a "burn-in" period to ensure convergence The last 5000 iterations from both chains combine to calculate the estimates We conduct standard eyeball scanning and Gelman and Rubin's (1992) F-statistic diagnostic to test the convergence of the chains (for detailed information about the log-likelihood functions and estimation method, see Park and Bradlow 2005)

To summarize, our model is an adaptation of Park and Bradlow's (2005) integrated modeling framework that captures consumers' dynamic bidding behavior (whether to bid, who bids, when to bid, and how much to bid) within auctions However, we made the following adaptations First, we explicitly model consumers' perceptions of unobserved seller credibility and product quality (i e , C_{ijm} and Q_{ijm}), whereas these are not the focus of Park and Bradlow's model Second, we model consumers' WTB across product categories, whereas Park and Bradlow's model focuses on auctions within one product category Third, we make the model more flexible by allowing the consumer's WTB to have different impacts on the bid speed in different decision stages In other words, we let the bid speed to be decision stage specific (d_{ijmk}, where k = 1, 2, or 3, representing decisions of whether to bid, who bids, and when to bid, respectively) Accordingly, we allow bid speed to have different effects on the consumer's decisions of whether to bid, who bids, and when to bid Finally, we allow bidder preference heterogeneity to be explained by bidder experience (Equation 13) using a hierarchical Bayesian framework This is different from Park and Bradlow's model, which takes into account heterogeneity only in the constant term

Empirical Applications

Data Description

We collect data from two areas—paintings and silver plates—of eBay's super antiques category We chose these areas because as representatives of the super antique category, their values may be determined by future resale prices Therefore, we speculate that asymmetric information and the affiliated-value elements may be greater for these product categories, which is important in studies of adverse selection issues (Bajari and Hortacsu 2004)

Our data contain 1324 auctions listed on eBay by 806 randomly selected participating bidders from April 15, 2001, to May 6, 2001 We randomly selected 75% of our sample for estimation and used the remaining 25% to form a holdout sample In Table 2, we report the definitions of all the variables we used and their sample statistics There were seven quality indicators adopted by eBay during our observation period The frequencies of the adoption of quality indicators are 72%, 16%, 72%, 24%, and 9%, respectively, for multiple picture postings, money-back guarantee, third-party payment, hidden reserve price, and the BIN option The mean of the minimum starting bid prices is $92 7, and the mean and standard deviation of the sellers' cumulative rating points are 458 02 and 796 86, respectively (We also tried the sellers' percentage of positive rating points in the estimation The results remain similar) The average number of days specified by the bidder is 7 35 days

The average bidding time is 28 48 hours since the start of the auction The average bidding amount, which reflects a bidder's observed bid amount, is $72 03, and 42% of the submitted bids occurred on weekends We follow the work of Wilcox (2000) and measure bidder experience by the bidder's cumulative feedback points, which approximate the total number of auctions The mean and standard deviation of bidders' experience are 104 9 and 203 9, respectively

Of the 1324 auctions, almost half result in no bids at all (i e , 49%) The average number of unique bidders for each auction is 1 06, ranging from 0 to 9 The average number of bids is 2 65 The mean of the BIN option price is $10 50, with a minimum of $0 and a maximum of $1,399 The average values of remaining time to the end of the auction (REMAIN), number of bids submitted before the rth bid (NUMBID), bid rate (BIDRATE), and the rate of bid increments (AMTRATE) are 95 05, 2 65, 04, and 44, respectively Finally, because we use two product categories in the data, we mean-center the category-specific variables by product category

TABLE 2
Definitions of Variables

	Seller's Options	M	(SD)
SRATING	Seller's cumulative rating point	458 02	(796 86)
THIRDPAY	Whether third-party payment is specified (1) or not (0)	72	(45)
PICTURE	Whether there are two or more pictures of the item (1) or not (0)	72	(13)
MONEY	Whether money-back guarantees are specified in the auction (1) or not (0)	16	(37)
MBID	Amount of minimum starting bid specified by the seller	92 70	(1026 64)
RESERVE	Whether the seller uses the hidden reserve price (1) or not (0)	24	(43)
BUYITNOW	Whether the seller uses the BIN option (1) or not (0)	09	(28)
BIDDAY	Number of days of an auction	7 35	(1 99)
	Bidder's Decisions/Characteristics		
BIDTIME	Bidder's bidding time in hours since the start of the auction	28 48	(71 15)
AMT	Bidder's bidding amount	72 03	(202 86)
WEEKEND	Whether a bid is placed on a weekend (1) or not (0)	42	(49)
BEXPER	Bidder's bidding experience (calculated from cumulative rating point)	104 87	(203 88)
	Other Auction- or Bid-Specific Variables		
WBID	Whether there is any bidder participating in the auction (1) or not (0)	51	(50)
NBIDDER	Number of unique bidders in an auction	1 06	(1 55)
BIN	The amount of BIN price	10 50	(68 72)
REMAIN	The remaining time to the end of the auction for a particular bid	95 05	(157 65)
NUMBID	The number of bids submitted before a particular bid	2 65	(3 82)
BIDRATE	The bid rate defined as (r – 1) divided by the total elapsed time	04	(09)
AMTRATE	The rate of bid increments as incremental bid amount at previous round divided by its elapsed time	44	(5 54)

We observe the number of people who view a particular auction and use it to approximate the total number of potential bidders I_{jm} for auction j in product category m We gather this information with an automatic counter option that is free and is set by sellers, this was employed in 87% of the auctions in our data For auctions without such information, we impute the value using the mode of the variable (approximately 72) This variable offers a good proxy of I_{jm} because the automatic counter uses each Internet user's cookie address to identify unique bidders, thus, we have additional information to measure the latent competition among dynamically changing potential bidders during the course of an auction, compared with Park and Bradlow's (2005) windowing procedure, which lacks this proxy information

Results

To evaluate the fit of our model, we estimate two benchmark models The first model considers only observed bidders and assumes that bidders are homogeneous, similar to our proposed model but without consideration of competition among latent bidders or bidder heterogeneity The second model is similar to Park and Bradlow's (2005) and incorporates competition among latent bidders but ignores bidder preference heterogeneity, except in the intercept

In Table 3, we report the log of posterior marginal density (Kass and Raferty 1995), the hit rate for the whether-to-bid model, and the mean absolute errors (MAEs) for the number of unique bidders in each auction, for when to bid, and for how much to bid using both the estimation and the holdout samples We also compute the Bayes factors (Kass and Raferty 1995) to assess model fit The results strongly favor our proposed model over the two benchmark models by odds of 329 9 and 199 6, respectively In addition, the proposed model performs better than the two benchmark models on all other dimensions for both the estimation sample and the holdout sample, which indicates the importance of recognizing latent bidder competition with endogenous entry and bidder preference heterogeneity

Impact of direct quality indicators H_1 In Table 4, we report the estimation results for the three models, focusing on Model 3, or our proposed model As we expected, α_{k1} (k = 1, 2, 3) are all estimated to be negative, which suggests that higher bidding surplus increases bidding speed because of the greater urgency for bidders with high surplus (Park and Bradlow 2005) The coefficient of PICTURE is significant and negative ($\phi_{13} < 0$) because multiple pictures reveal more information about product quality and help bidders differentiate high- from low-quality products This reduction in incomplete information leads consumers to be more willing to participate, which results in more auction participants (i e , $\alpha_{11} \times \phi_{13} > 0$, and $\alpha_{21} \times \phi_{13} > 0$) However, $\phi_{13} < 0$ suggests that this direct indicator reduces consumers' bidding amount because rational bidders expect more participants and strategically shade their bidding amount to counter the winner's curse In addition, $\alpha_{31} \times \phi_{13} > 0$ suggests that as consumers' bid rates increase, they tend to bid early, because the quality indicators provide more information about product quality, bidders are less likely to rely on competitive bids to determine value, and therefore bidders do not need to update their bids constantly

Money-back guarantees (MONEY) have a significant and negative effect on consumers' WTB and bidding amount (i e , $\phi_{14} < 0$) They reduce incomplete information, so consumers become more likely to participate in the auction ($\alpha_{11} \times \phi_{14} > 0$, and $\alpha_{21} \times \phi_{14} > 0$) and bid early ($\alpha_{31} \times \phi_{14} > 0$) To counter the winner's curse, consumers strategically shade their bids ($\phi_{14} < 0$) Therefore, for both multiple picture postings and money-back guarantees, we find support for H_1

Impact of indirect quality indicators H_2 In contrast to the direct quality indicators, the indirect quality indicators (RESERVE and BUYITNOW) increase WTB and bidding amount ($\phi_{16} > 0$ and $\phi_{17} > 0$), making consumers less likely to participate (given $\alpha_{k1} \times \phi_{16\text{–}7} < 0$ for k = 1, 2) Indirect quality indicators discourage general participation because RESERVE and BUYITNOW eliminate buyers with low willingness to pay and high participation costs Because fewer bidders participate, consumers become less concerned about the winner's curse and experience increased WTB and bidding amounts ($\phi_{16} > 0$ and $\phi_{17} > 0$) Thus, for hidden reserve prices and BIN options, the empirical results support H_2 However, consumers tend to bid later after

TABLE 3
Comparison of Competing Models

Sample	Criterion	Homogeneous Model with Observed Bidders Only	Park and Bradlow (2005) Model with Latent Bidders	Proposed Model
Estimation sample[a]	Log-marginal density	–868,900 0	–868,700 4	–868,570 1
	Hit rate for whether to bid model	899	908	923
	MAE for number of unique bidders	3 309	2 028	1 490
	MAE for when to bid model	11 500	4 392	2 549
	MAE for how much to bid model	4 566	3 059	1 944
Holdout sample[b]	Hit rate for whether to bid model	790	815	836
	MAE for number of unique bidders	3 772	3 081	2 390
	MAE for when to bid model	13 021	5 078	3 234
	MAE for how much to bid model	5 872	3 531	1 925

[a] Number of auctions = 993, and number of observations = 2772
[b] Number of auctions = 331, and number of observations = 863

TABLE 4
Estimation Results

Variable Types	Covariates (Coefficients)	Homogeneous Model with Observed Bidders Only	Park and Bradlow (2005) Model with Latent Bidders	Proposed Model
Intercept	INTERCEPT – Silver plate (β_{i10})	070 (167)	– 036 (022)	1 997[a] (162)
	INTERCEPT – Painting (β_{i20})	2 564[a] (541)	911[a] (102)	2 151[a] (234)
Seller's credibility indicators	SRATING (ϕ_{i1})	240 (638)	–1 238[a] (336)	– 324[a] (019)
	THIRDPAY (ϕ_{i2})	2 081[a] (729)	–6 369[a] (399)	– 367[a] (014)
Direct quality indicators	PICTURE (ϕ_{i3})	1 001 (623)	–4 924[a] (357)	– 405[a] (010)
	MONEY (ϕ_{i4})	031 (1 066)	245 (658)	– 055[a] (014)
Indirect quality indicators	MBID (ϕ_{i5})	265 (152)	– 151[a] (041)	021 (028)
	RESERVE (ϕ_{i6})	– 637 (614)	– 729[a] (349)	036[a] (022)
	BUYITNOW (ϕ_{i7})	2 334 (1 693)	–1 562[a] (761)	197[a] (019)
Interactions between credibility indicator and quality indicator	SRATING × PICTURE (ϕ_{i8})	225 (293)	– 142 (264)	– 146[a] (011)
	SRATING × MONEY (ϕ_{i9})	– 370 (325)	473 (261)	– 125[a] (010)
	SRATING × MBID (ϕ_{i10})	– 599 (3 414)	–3 818[a] (1 359)	– 100[a] (054)
	SRATING × RESERVE (ϕ_{i11})	288 (500)	035 (435)	– 009 (064)
	SRATING × BUYITNOW (ϕ_{i12})	2 365 (2 031)	1 147 (780)	– 205 (121)
	THIRDPAY × PICTURE (ϕ_{i13})	–1 619[a] (757)	5 222[a] (452)	382[a] (010)
	THIRDPAY × MONEY (ϕ_{i14})	– 542 (1 217)	– 385 (812)	– 097[a] (048)
	THIRDPAY × MBID (ϕ_{i15})	–4 197 (3 753)	5 233[a] (2 161)	– 455[a] (055)
	THIRDPAY × RESERVE (ϕ_{i16})	–1 273 (822)	1 774[a] (516)	– 001 (014)
	THIRDPAY × BUYITNOW (ϕ_{i17})	– 811 (1 685)	794 (751)	– 119[a] (062)
Other control variables	BIDDAY (β_{i1})	208[a] (076)	– 291[a] (045)	002 (002)
	WEEKEND (β_{i2})	–2 151[a] (461)	535[a] (267)	122[a] (017)
	REMAIN (β_{i3})	– 014 (025)	– 001 (010)	– 016[a] (003)
	NUMBID (β_{i4})	– 156[a] (032)	015 (012)	022[a] (003)
	BIDRATE (β_{i5})	– 892 (1 047)	448 (426)	147[a] (027)
	AMTRATE (β_{i6})	013 (018)	002 (004)	– 033[a] (007)
Bid speed	α_{10}	478[a] (130)	– 301[a] (059)	– 629[a] (041)
	α_{11}	– 946[a] (040)	– 310[a] (067)	– 686[a] (082)
	α_{20}	255 (134)	– 014 (022)	100[a] (040)
	α_{21}	263[a] (144)	119[a] (025)	– 019[a] (002)
	α_{30}	233[a] (103)	– 269[a] (075)	– 613[a] (071)
	α_{31}	– 843[a] (057)	– 288[a] (069)	– 674[a] (053)
Bid BIN price	δ_0	9 976 (6 982)	5 100 (8 385)	11 480[a] (5 111)
	δ_1	7 361 (6 878)	9 066 (6 420)	1 796 (9 295)

[a]Zero lies outside the 95% posterior probability interval

observing the use of these two indicators, conditional on being a bidder ($\alpha_{31} \times \phi_{i6-7} < 0$), perhaps because they believe that the chance of winning such an auction is low and thus wait to bid (Budish and Takeyama 2001, Katkar and Reiley 2006)

The minimum starting bid (MBID) has an insignificant impact on consumers' bidding amount, entry, and bidding time, though its coefficient is positive ($\phi_{i5} > 0$), consistent with Standifird's (2001) findings This result may be due to the usual low values of minimum starting bids set by sellers (e g , a median of $15 with a minimum of $ 01 in our sample), which thus may not become constraints for bidders Therefore, we find partial support for H_2

Impact of credibility indicators H_3 Credibility indicators should encourage bid participation, decrease bidders' bidding amount, and encourage bidders to bid early In Table 4, we show the support we find for H_3 The seller's feedback rating (SRATING) and the use of third-party payment methods help high-credibility sellers distinguish themselves from low-credibility sellers by revealing their true credibility Consumers are more confident about participating in the auctions of sellers that use third-party payment systems and thus become more likely to participate in the auction ($\alpha_{k1} \times \phi_{i1-2} > 0$ for $k = 1, 2$) However, from the consumers' point of view, this willingness increases the expected number of participating bidders, so they shade their WTB ($\phi_{i1-2} < 0$) The coefficient for bid surplus in Equation 5 is negative ($\alpha_{31} < 0$), so $\alpha_{31} \times \phi_{i1-2} > 0$, which indicates that as consumers' bid rate increases, they become more likely to bid early, assuming that they bid This finding is consistent with previous results in auction literature (Ba and Pavlou 2002, Brinkman and Siefert 2001, Dewan and Hsu 2001, Houser and Wooders 2006, Livingston 2005) The reduction of quality uncertainty makes consumers less likely to depend on other bidders' bidding information Because they do not need to observe competitive bids to determine value, bidders do not need to update their bids constantly, in support of H_3

Interaction between credibility indicators and quality indicators H_4 The coefficients of the interaction terms between SRATING or THIRDPAY and most of the quality indicators are significant with expected signs, which implies that sellers' cumulative rating points or third-party payment amplify the effects of quality indicators on bidders' decisions about entry, bidding time, and bidding amount Higher accumulative ratings and the use of third-party payment imply greater consistency between the sellers' signals and the true quality of their products Therefore, higher ratings or third-party payment methods make sellers' indicators more credible and amplify the effect of quality indicators After observing the use of both credibility and quality indicators, rational consumers become more likely to participate in the auction ($\alpha_{k1} \times \phi_{18-17} > 0$ for k = 1, 2), to shade their bids ($\phi_{18-17} < 0$), and to bid early ($\alpha_{31} \times \phi_{18-17} > 0$) The only exception is the interaction between THIRDPAY and PICTURE, which is significant and positive, perhaps because these signals are significantly different, such that the former is default contingent and the latter is default independent (Kirmani and Rao 2000) Overall, we find support for H_4

Impact of bidder heterogeneity on the effects of credibility indicators and quality indicators H_5 As we show in Table 5, the effect of the indicators differs across bidders' experiences Most heterogeneity coefficients are significant, that is, the impacts of credibility or quality indicators on consumers' bidding decisions are stronger for bidders with more experience If we use multiple picture postings as an example, we note that the negative effect of BEXPER on the picture posting coefficient indicates that posting multiple pictures encourages auction participation and bid shading, and the effect is greater for experienced bidders, who make better inferences about quality indicators and are less likely to suffer from the winner's curse, in support of previous research (Bajari and Hortacsu 2004, Kagel and Roth 1995, Wilcox 2000) Similarly, the negative effect of BEXPER on the seller's cumulative rating points (SRATING) coefficient indicates that this credibility indicator is more effective for experienced bidders, encouraging them to shade their bidding amount Therefore, in general, we find support for H_5 However, the enhancing impact of the bidder's experience does not differ according to the two types of indicators (direct versus indirect) Experienced bidders understand the auction mechanism and signaling roles of indicators better than less experienced bidders, which enables them to make better use of the information delivered by the indicators, which in turn increases their impact This logic holds for both direct and indirect indicators

Other auction context variables The effects of other auction context variables on bidders' WTB include the intercept for the painting category, which is greater than that for the silver plate category, as we show in Table 4, perhaps because the value of auctioned items in the latter category is normally lower The duration of an auction (BIDDAY) does not have a significant impact on WTB, bidding time, or bidding amount, in support of previous research (Dholakia and Soltysinski 2001, Gilkeson and Reynolds 2003) If a bid occurs over a weekend (WEEKEND), consumers are more likely to increase their WTB, perhaps because they have more free time on weekends and, therefore, lower psychological bidding costs When more time remains before the end of the auction (REMAIN), WTB tends to be lower However, the higher the number of bids

TABLE 5
Estimation Results for Heterogeneity Equation

Covariates	Intercept	BEXPER
INTERCEPT – Silver plate	2 211[a] (180)	–1 857[a] (252)
INTERCEPT – Painting	2 198[a] (269)	– 206[a] (039)
SRATING	– 014 (023)	–3 125[a] (042)
THIRDPAY	– 311[a] (009)	– 513[a] (064)
PICTURE	– 351[a] (010)	– 500[a] (032)
MONEY	– 092[a] (017)	346[a] (188)
MBID	121[a] (021)	– 933[a] (176)
RESERVE	– 105[a] (014)	1 296[a] (135)
BUYITNOW	010 (031)	1 731[a] (231)
SRATING × PICTURE	– 030[a] (011)	–1 071[a] (032)
SRATING × MONEY	– 011 (020)	–1 060[a] (129)
SRATING × MBID	– 518[a] (055)	3 861[a] (117)
SRATING × RESERVE	– 034 (024)	237 (567)
SRATING × BUYITNOW	129[a] (062)	–3 086[a] (1 355)
THIRDPAY × PICTURE	293[a] (011)	824[a] (044)
THIRDPAY × MONEY	175[a] (022)	–2 516[a] (321)
THIRDPAY × MBID	– 488[a] (059)	304[a] (093)
THIRDPAY × RESERVE	– 035 (023)	316[a] (124)
THIRDPAY × BUYITNOW	060 (046)	–1 651[a] (300)
BIDDAY	008[a] (003)	– 055[a] (014)
WEEKEND	070[a] (016)	490[a] (062)
REMAIN	– 013[a] (004)	– 028[a] (014)
NUMBID	024[a] (004)	– 021 (018)
BIDRATE	– 249[a] (031)	3 653[a] (105)
AMTRATE	– 020[a] (010)	– 121 (086)

[a]Zero lies outside the 95% posterior probability interval

submitted before each bid (NUMBID) or the higher the bid rate (BIDRATE), the higher is bidders' WTB This supports our argument that the affiliated value in these auctions emerges because consumers' valuation is affected by competition When the rate of bid increments (AMTRATE) increases, bidders become more cautious and strategically shade their bids to avoid the winner's curse, consistent with Park and Bradlow (2005)

Because the coefficient of surplus δ_1 for how much to bid in Equation 11 is insignificant, consumers' valuations relative to the BIN price do not have a significant impact on whether to exercise the BIN option Because indirect quality indicators drive up consumers' WTB, sellers with high feedback rating points can increase their final bidding prices and profit margins Finally, both the variance of the unobserved auction-specific coefficient φ_j (i e , $\sigma^2_\varphi = 135$, SD = 030) and the variance of the preference heterogeneity σ^2_φ (1 494, SD = 124) are significant, which indicates their significant impacts

Comparison with benchmark models When we compare the results from our proposed model with those of the benchmark models, we find that the coefficient estimates are sensitive to the inclusion of latent competition among potential bidders and bidder preference heterogeneity For example, in Table 4, the homogeneous model with observed bidders only (first benchmark model), which is similar to most models in existing empirical research, shows that the three indirect indicators have no significant impact on WTB or bidding amount The second benchmark model takes into account the role of latent bidders and their unobserved bidding competition, and the impacts of these indicators become significantly negative This finding demonstrates the importance of modeling latent bidder competition Furthermore, when we incorporate bidders' preference heterogeneity into the second benchmark model, the impacts of the indicators become significantly positive, consistent with the findings in choice literature that the failure to account for consumers' unobserved preference heterogeneity leads to inconsistent and biased estimates (Allenby and Rossi 1999, Gonul and Srinivasan 1996) Overall, we find support for all five hypotheses The proposed signaling-based hypotheses are consistent with the estimation results and provide coherent explanations of consumers' bidding behavior

Simulations To demonstrate the implications of the signaling effect of eBay's features on consumers' bidding behavior more intuitively, we conduct a series of policy simulations based on estimates from the proposed model As we show in Table 6, we change the frequency of the use of each indicator and simulate the probability of auction participation, average number of latent bidders, mean interbidding time since last bid, average final bid price (i e , last observed bidding amount in an auction[6]), and average bidding experience of the participating bidders to determine how these various indicators might affect consumers' bidding decisions

When we increase the percentage of auctions with multiple picture postings and money-back guarantees by 10% separately, participation probabilities increase by 1 04% and 84%, respectively If we increase the frequency of the use of the two indicators by 20%, it encourages auction participation even more (1 13% and 1 41%) These increases also attract 3 53% and 1 34% more latent bidders to a particular bid on average, respectively Therefore, multiple pictures and money-back guarantees are effective in attracting more potential bidders because they reduce the bidders' quality uncertainty and encourage participation Thus, direct quality indicators help alleviate the lemons problem

TABLE 6
Simulation Results

Indicators	Value or Change	Probability of Participation	Average Number of Unique Latent Bidders	Interbidding Time Since Last Bid	Average Final Bid Price	Experience of Participating Bidders
Current values		512	26 60	799	139 31	129 22
Picture postings	10% increase	+1 04%	+3 53%	–4 78%	–2 15%	+1 91%
	20% increase	+1 13%	+13 76%	– 34%	–3 10%	+2 93%
Money-back guarantee	10% increase	+ 84%	+1 34%	– 65%	–1 21%	+ 36%
	20% increase	+1 41%	+ 06%	– 29%	–1 35%	+1 39%
BIN	10% increase	– 82%	–3 31%	+2 77%	+1 62%	+ 39%
	20% increase	–1 07%	–3 29%	+ 44%	+1 48%	+1 36%
Hidden reserve	10% increase	–1 13%	–1 58%	+1 80%	+3 10%	+ 44%
	20% increase	– 57%	–2 61%	+ 46%	+2 29%	+1 47%
Minimum starting bid	10% increase	– 41%	– 04%	+1 28%	+ 10%	+ 25%
	20% increase	– 56%	–1 69%	+1 83%	+ 40%	+ 75%
Seller's feedback rating	10% increase	+ 29%	+11 10%	–2 01%	– 55%	+3 09%
	20% increase	+ 37%	+12 63%	–3 13%	– 25%	+4 43%
Third-party payment	10% increase	+1 17%	+10 43%	–2 02%	– 63%	+2 30%
	20% increase	+1 54%	+13 03%	–4 17%	– 13%	+3 54%

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[6] The last observed bidding amount is the second-highest bidder's maximum bid because the winning bidder's maximum bid is unobservable At eBay, the bidder with the highest maximum bid wins the item and pays a price equal to the second-highest bidder's maximum bid plus the bid increment

Increasing the percentage of auctions with multiple picture postings and money-back guarantees by 10% separately also reduces the bidder's interbidding time since the last bid (in hours) by 4 78% and 65%, respectively Consumers shade their final bid price by 2 15% and 1 21%, respectively, because they observe the significant increase in the number of latent bidders and shade their bids to correct for the potential winner's curse That is, the use of quality indicators encourages early bidding but decreases the final bid price However, bid shading is not very dramatic for the products we study, the average observed final bid price is $148 15 across all auctions We do not attempt to make any conclusions about whether bidders shade the bids enough, because we cannot observe the true values of the auctioned items Further research should examine the impacts of quality indicators on the degree of the winner's curse by collecting true value information about items (Bajari and Hortacsu 2003) The increasing use of multiple picture postings and money-back guarantees also attracts more experienced bidders by 1 91% and 36%, respectively, which suggests that more experienced bidders tend to understand the indicators better and make better use of such information

In contrast, a 10% greater frequency of auctions with BIN options, hidden reserve prices, or minimum starting bids reduces participation probability by 82%, 1 13%, and 41%, respectively In addition, they significantly decrease the number of latent bidders by 3 31%, 1 58%, and 04% and encourage late bidding with the delay of 2 77%, 1 80%, and 1 28%, respectively Thus, using indirect quality indicators may worsen the lemons problem because placing either lower or upper bounds on valuations discourages bidder entry However, having fewer latent bidders causes the final bid price to increase by 1 62%, 3 10%, and 10%, respectively Similar to the direct indicators, these indicators attract more experienced bidders at levels of 39%, 44%, and 25%, respectively Therefore, when considering such quality indicators, sellers should balance the lower auction participation rates against the higher final bid price Although indirect quality indicators discourage participation, they may not significantly worsen the lemons problem, because they discriminate in discouraging inexperienced bidders who may be less serious about purchasing Thus, the use of such indicators may benefit sellers with high-quality products

The simulation results finally show that the use of credibility indicators significantly increases bidders' auction entry probability and encourages early bidding and bid shading As we show in Table 6, when we increase a seller's feedback rating or the percentage of auctions designed with third-party payment by 10%, the probability of participation increases by 29% and 1 17%, the average number of latent bidders jumps by a significant 11 10% and 10 43%, interbidding time decreases by 2 01% and 2 02%, the final bid price decreases by 55% and 63%, and the average bidder experience increases by 3 09% and 2 30%, respectively Again, bid shading is not dramatic for the products in this study, so credibility indicators significantly mitigate the lemons problem Credibility indicators can improve consumers' trust in both auction sellers and the auctioned items

Conclusion, Managerial Implications, and Further Research

Many consumers reject Internet auctions because of the physical separation of buyers from sellers Since the emergence of the Internet, auction companies have attempted to find the most efficient design for their auction mechanisms The rapid expansion of Internet auctions to consumer-to-consumer and business-to-consumer markets for an increasing number of consumer products and services also demands research into how Internet auction designs affect bidding behavior We systematically evaluate the effect of auction features (i e , sellers' cumulative ratings, third-party payment, picture postings, money-back guarantees, minimum bidding price, hidden reserve price, and BIN option) on consumer bidding behaviors, and we provide implications for how these features can help solve the lemons problem

We acknowledge dual information asymmetry in Internet auctions and therefore develop a typology of Internet auction indicators of seller credibility and product quality that consists of hypotheses about how these indicators may help alleviate the lemons problem We adopt an appropriate modification of Park and Bradlow's (2005) model to test empirically how these quality indicators affect bidders' decisions about whether to bid, who bids, when to bid, and how much to bid By accounting for the latent competition among potential bidders, consumer heterogeneity, and the interdependence of bidding decisions, this proposed model simultaneously evaluates the signaling roles of interdependent bidding decisions and accounts for consumer heterogeneity Specifically, we (1) examine whether Internet auction features serve as effective credibility or quality indicators, (2) analyze factors that affect the reliability and credibility of the indicators, (3) study how different types of indicators affect bidding behavior and their implications for the lemons problem, and (4) investigate how the signaling effect differs across bidders with different experience

Reputable sellers with high-quality products can use eBay's features to signal their credibility and the products' true quality in each auction and to enhance their reputation and thus distinguish themselves from disreputable sellers or sellers of low-quality items As a result, bidders benefit from reduced uncertainty about both the sellers' credibility and the quality of their items, which directly affects bidding behavior and WTB Consistent with common intuition, credibility or direct quality indicators encourage bidders to participate and prompt bid shading in response to concerns about the winner's curse, the opposite is true for indirect quality indicators However, the bid shading resulting from direct indicators is not very dramatic Moreover, the simultaneous use of credibility and quality indicators strengthens the effects of quality indicators More experienced consumers make better inferences about the roles of both credibility and quality indicators These results are even more evident in the simulation results We find that the proposed signaling-based hypotheses are consistent with the estimation results and provide coherent explanations of consumers' bidding behavior

Our study has important managerial implications for Internet auctions sites and sellers, which can use these findings to improve auction site designs and to provide more credibility and quality indicators to improve site use and traffic. Reputable online sellers of high-quality products should combine various credibility and quality indicators to reveal their true credibility and quality, to encourage auction participation, and to enjoy higher closing prices. Thus, we empirically establish the role of Internet auction features as quality or credibility indicators.

This research is subject to several limitations that provide avenues for further research. First, because our intent was to focus on how quality signals help solve the lemons problem, we modeled four interdependent bidding decisions—whether to bid, who bids, when to bid, and how much to bid—based on the assumption of affiliated-value auctions. Additional research might consider private-value auctions and compare them with affiliated-value auctions to better understand the role of the Internet auction indicators. Second, it would be worthwhile to study the dynamics of bidding behavior across multiple auctions over time (e.g., Zeithammer 2006, 2007). For example, how do forward-looking bidders revise their bidding strategies when they observe multiple listing of similar items at the same time? More structural models might enable bidders to update their formation of affiliated value in a Bayesian manner, on the basis of periodically observed decisions of other bidders within and across auctions. Third, we focused on consumer bidding behavior and treated the sellers' decisions as exogenous, but experienced sellers might be strategic in adopting credibility or quality indicators. Therefore, it would be worthwhile to incorporate the strategic behavior of sellers to draw implications about the best strategy to maximize sellers' profits as part of the customer relationship management efforts. The modeling approach that Bajari and Hortacsu (2003) use seems promising in this venue. Finally, we provide empirical evidence about how Internet auction features signal product quality and seller credibility and how these features affect consumers' bidding behavior. Analytical models can be developed to examine the rationale behind these strategies and to compare different indicators in terms of signaling costs.

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Competing Loyalty Programs: Impact of Market Saturation, Market Share, and Category Expandability

Loyalty programs have become an important component of firms' relationship management strategies. There are now some industries in which numerous rival loyalty programs are offered, inducing intense competition among these programs. However, existing research on loyalty programs has often studied such programs in a noncompetitive setting and has often focused on a single program in isolation. Addressing this gap, this research examines the effect of a firm's competitive positioning and market saturation on the performance of the firm's loyalty program. Based on the analysis of firm- and individual-level data from the airline industry, the results indicate that larger firms tend to benefit more from their loyalty program offerings than smaller firms. Moreover, when the product category demand is rigid, the impact of an individual loyalty program decreases as the marketplace becomes more saturated with competing programs. However, when the product category is highly expandable, the saturation effect disappears. Under such situations, loyalty programs can help an industry gain competitive advantage over substitute offerings outside the industry, and multiple programs can effectively coexist even under a high level of market saturation.

Keywords: loyalty programs, market share, market saturation, category expandability, resource-based view

Although loyalty programs have been around for quite some time, consumer enthusiasm to embrace these programs has not abated but rather has rapidly grown over the recent years. From 2000 to 2006, total loyalty program enrollments in the United States increased 35.5% to 1.5 billion (Ferguson and Hlavinka 2007). In parallel to favorable responses from consumers, many firms have installed loyalty programs as a core component of their marketing strategy. This proliferation of loyalty programs reflects a changing market environment that is increasingly characterized by intense competition, more demanding and knowledgeable consumers, and a development toward relationship marketing and customer relationship management in marketing thinking and practice.

A consequence of this enthusiasm toward loyalty programs is the increasing competition among rival programs, especially in sectors such as airline, financial services, retail, hotel, and gaming (Ferguson and Hlavinka 2007). In the credit card industry, for example, half of general-purpose credit cards offer a reward program (Visa USA Research Services 2006). Similar high adoption rates have been observed in the retail sector across multiple countries (Van Heerde and Bijmolt 2005). This pervasiveness of loyalty programs has led some researchers to conclude that such programs may be a necessary cost of doing business in certain industries, especially for new entrants into those industries (Ferguson and Hlavinka 2007; Meyer-Waarden and Benavent 2006). Some also argue that membership in multiple loyalty programs may eventually cancel out the effects of each individual program (Magi 2003). With a large number of competing loyalty programs, are firms merely giving away profits in a desperate struggle to win business, much like the airline price war in the early 1990s? Or are loyalty programs a viable strategy that can increase revenue potentials, even with competitive offerings in the same market?

Answers to such questions have accumulated in recent years, but the conclusion is still unclear. Not only does the impact of loyalty programs vary across different consumer segments within a firm (e.g., Lewis 2004; Liu 2007), but mixed results are also found for firm-level outcomes (e.g., Leenheer et al. 2007; Magi 2003; Sharp and Sharp 1997). Consequently, serious doubts have been raised about the value of loyalty programs (Dowling and Uncles 1997; Shugan 2005). Part of the divergence in existing findings can be attributed to a lack of considering the market environment in which loyalty programs operate. Most studies have examined a single program in isolation, when in reality multiple loyalty programs are often offered by competing firms. It is unclear how these competitive forces shape the performance of a loyalty program. This has prompted calls from several marketing scholars for more research on loyalty program competition (Leenheer et al. 2007; Liu 2007; Verhoef 2003).

The current research responds to such calls and contributes to a better understanding of loyalty programs in

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several ways First, it examines the interaction among rival loyalty programs and incorporates market- and firm-level factors to explain the varying performances of such programs Although some research has attempted to explain loyalty program performance through program design factors, few studies have examined how external factors in the environment may affect the success of a program In this study, we attempt to answer how loyalty program performance is affected by market saturation and the relative size of the offering firm By considering these competitive factors, this research remedies the tendency to study loyalty program effects in a vacuum void of competitive influences and thus presents a more realistic assessment of such programs Because loyalty program initiatives often require costly long-term investments, a more realistic assessment of their potential effects will help firms make more informed decisions and avoid costly mistakes

Second, this research investigates an important contingency factor—category expandability—on the dynamics of competition among loyalty programs Because individual product categories often do not stand alone in the market but rather compete with substitute products that satisfy similar needs, the expandability of the market boundary can affect the success of loyalty programs (Leenheer et al 2007) Using a game-theoretic approach, Kopalle and Neslin (2003, p 22) conclude that a "key factor determining the economic viability of frequency reward programs is the extent to which they can be used to expand the category" This research extends their work and empirically tests this proposition at the individual level

Finally, because of self-selected enrollment and time trend effects, researchers have argued that neither cross-sectional nor longitudinal data alone can establish a clear causal relationship with regard to loyalty programs (Verhoef 2003) Addressing this concern, the current research combines cross-sectional and longitudinal data from the airline industry and thus controls for the confounding factors in either type of data It also considers heterogeneity among firms, which allows for a more accurate assessment of loyalty program effects

Conceptual Background

Defining the Scope of Loyalty Programs

We define loyalty programs as long-term-oriented programs that allow consumers to accumulate some form of program currency, which can be redeemed later for free rewards An airline's frequent-flier program represents a typical loyalty program By focusing on long-term programs, we exclude promotional programs that offer only one-shot, immediate benefits, such as instant-win scratch cards and grocery stores' discount card programs In contrast to loyalty programs that are designed to create a future orientation and increase switching costs over the long run (Kim, Shi, and Srinivasan 2001, Lewis 2004), these short-term promotions are more likely to create sudden changes in sales without producing sustained customer loyalty or revenue potential for a firm Research has shown different mechanisms underlying these one-shot, immediate reward programs compared with long-term loyalty programs that offer consumers delayed rewards (Yi and Jeon 2003, Zhang, Krishna, and Dhar 2000) Confirming this view, Leenheer and Bijmolt (2008) find that delayed rewards in a loyalty program have a significant impact on customer loyalty, whereas one-shot promotional features do not Therefore, we consider it more appropriate to separate the two types of programs Our decision is also supported by different financial implications of the programs, with one-shot programs incurring immediate costs and benefits and long-term loyalty programs creating long-term obligations and value for a firm

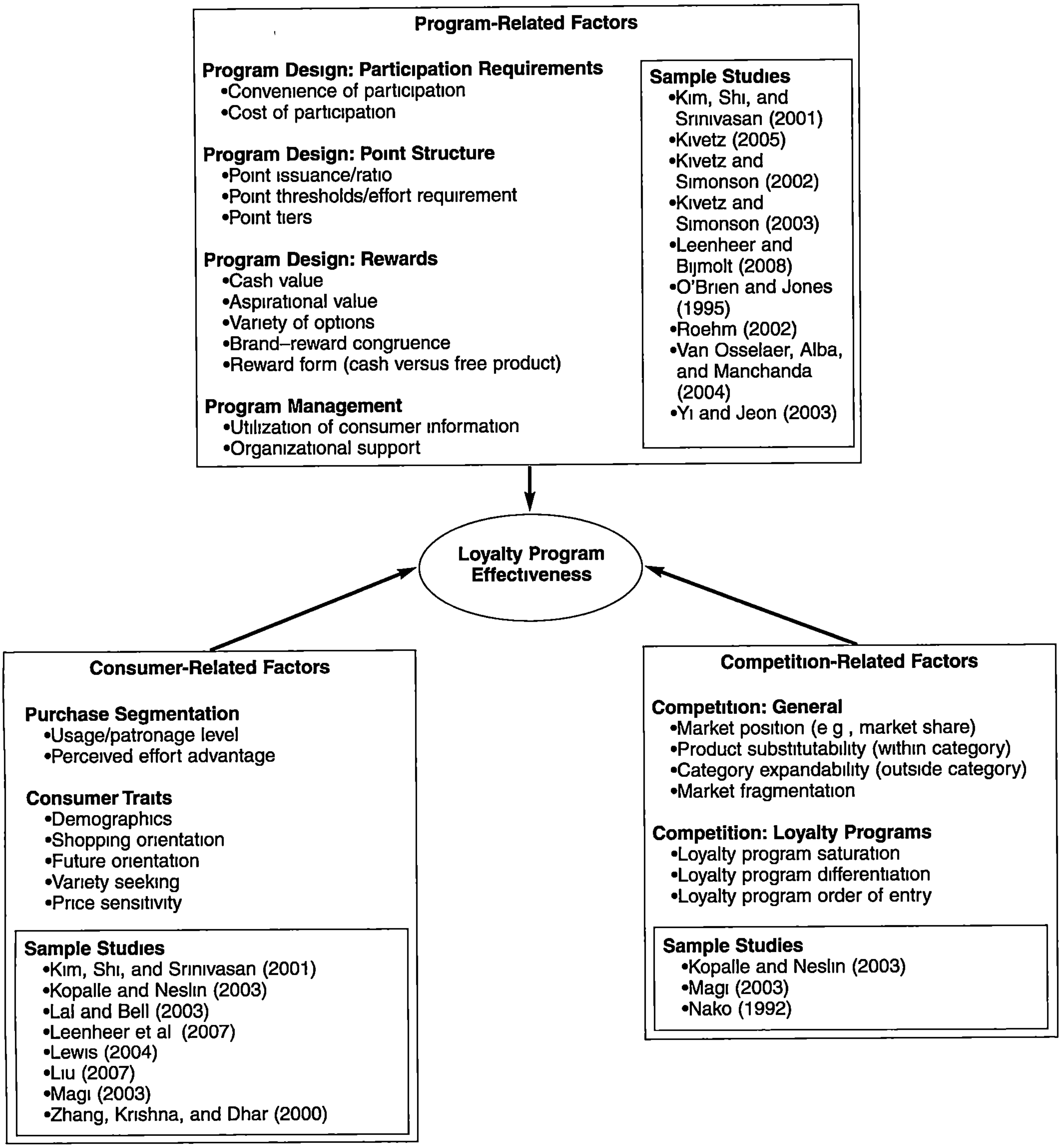
Diverse Performances of Loyalty Programs

Prior research has documented mixed outcomes of loyalty programs operating in the same markets For example, Meyer-Waarden and Benavent (2006) compare a consumer panel's observed purchases at seven grocery stores with Dirichlet predictions and find excessive loyalty attributable to loyalty programs for only three stores The loyalty programs that Leenheer and colleagues (2007) study also varied on their share-of-wallet impact and profitability A natural question from these mixed findings is why loyalty programs exhibit diverse performance Although this phenomenon may not be surprising, a systematic understanding of the factors contributing to diverse loyalty program performances is important because it can aid in managers' assessment of whether a loyalty program is appropriate in a certain context and can help identify ways of improving the effectiveness of such programs (Bolton, Kannan, and Bramlett 2000)

In studying loyalty program performance, it is important to recognize that loyalty programs do not operate as separate entities in an isolated environment Their success depends not only on the programs themselves but also on other facilitating or inhibiting factors present in the environment Specifically, we propose three sets of factors that represent the main market entities involved the focal loyalty program, the consumers (i e , target market), and rival programs and firms (i e , competition) Figure 1 lists the factors and sample studies within each set Of these, program-related factors explain a firm's internal strategies that can contribute to the success of a loyalty program, whereas consumer and competition factors represent things in the external environment that are equally important to loyalty program performance We argue that it is the joint force of all these factors that determines the eventual outcome of a loyalty program This line of thinking resembles other studies of marketing strategy, in which the initiation and outcomes of marketing strategies are affected by both the internal environment of the firm and external market and industry environments (Varadarajan and Jayachandran 1999)

In the following sections, we first review existing research that has examined some of the factors in our proposed framework From the review, we note the relative void of studies on competition-related factors, and we focus on these factors in our two studies Before we turn to the literature, however, it is important to note that loyalty program performance can be measured in multiple ways

FIGURE 1
Factors Affecting Loyalty Program Effectiveness


Program-Related Factors
Program Design: Participation Requirements
•Convenience of participation
•Cost of participation
Program Design: Point Structure
•Point issuance/ratio
•Point thresholds/effort requirement
•Point tiers
Program Design: Rewards
•Cash value
•Aspirational value
•Variety of options
•Brand–reward congruence
•Reward form (cash versus free product)
Program Management
•Utilization of consumer information
•Organizational support
Sample Studies
•Kim, Shi, and Srinivasan (2001)
•Kivetz (2005)
•Kivetz and Simonson (2002)
•Kivetz and Simonson (2003)
•Leenheer and Bijmolt (2008)
•O'Brien and Jones (1995)
•Roehm (2002)
•Van Osselaer, Alba, and Manchanda (2004)
•Yi and Jeon (2003)
Loyalty Program Effectiveness
Consumer-Related Factors
Purchase Segmentation
•Usage/patronage level
•Perceived effort advantage
Consumer Traits
•Demographics
•Shopping orientation
•Future orientation
•Variety seeking
•Price sensitivity
Sample Studies
•Kim, Shi, and Srinivasan (2001)
•Kopalle and Neslin (2003)
•Lal and Bell (2003)
•Leenheer et al (2007)
•Lewis (2004)
•Liu (2007)
•Magi (2003)
•Zhang, Krishna, and Dhar (2000)
Competition-Related Factors
Competition: General
•Market position (e g , market share)
•Product substitutability (within category)
•Category expandability (outside category)
•Market fragmentation
Competition: Loyalty Programs
•Loyalty program saturation
•Loyalty program differentiation
•Loyalty program order of entry
Sample Studies
•Kopalle and Neslin (2003)
•Magi (2003)
•Nako (1992)

Nunes and Drèze (2006) suggest that loyalty programs can serve different goals, such as retaining customers, increasing spending, and gaining customer insights Therefore, each program should have its own unique set of success measures depending on its intended goals For cross-comparison purposes, however, it is also useful to examine some standard measures Prior research has used consumer-level outcomes, such as purchase frequency, transaction size, and share of wallet, as well as firm-level factors, such as store sales and traffic Although all these measures are useful, because each measure may be driven by different underlying mechanisms, caution should be taken before directly comparing some of the existing studies.

Existing Research on Loyalty Program Performance

Program-related factors. Program-related factors include both program design and management. From the design perspective, a loyalty program needs three key specifications: (1) participation requirements, (2) point structure, and (3) rewards. The first element pertains to the convenience and cost of participation. Participation modes can be differentiated by voluntary versus automatic enrollment and free versus fee-based membership. Programs also differ in terms of how convenient it is for consumers to participate (O'Brien and Jones 1995). For example, some programs automatically accumulate points, whereas others require more effort from consumers, such as manual code entry required by My Coke Rewards. O'Brien and Jones (1995) suggest that the convenience of participation can affect the appeal of a loyalty program. So far, however, the effects of participation requirements have not received much empirical examination.

The second aspect of a loyalty program, point structure, involves how reward points are issued, what the point thresholds are for redeeming rewards, and whether a tiered structure is used. Regarding the issuing of reward points, Van Osselaer, Alba, and Manchanda (2004) find that though point threshold stays the same, the way points are issued over each purchase (ascending points versus same points per purchase) affects consumers' choices. This suggests that point issuance is not a nuisance to consumers and should not be determined arbitrarily. Point threshold is another important aspect of point structure, and it has been tied in to program relevance (O'Brien and Jones 1995). If the point threshold for a free reward is too high, it will be considered unobtainable for the average consumers and thus will be dismissed as irrelevant. The final aspect of point structure involves tiered structures (e.g., gold and platinum memberships based on spending levels). Taking this tiered structure into account, Kopalle and colleagues (2007) find that program tiers create a point pressure effect on purchases by both price-conscious and service-oriented consumers, whereas the frequency reward itself creates such an effect only for price-conscious consumers.

The third design element, choice and availability of rewards, has received the most extensive attention in existing studies. This design element includes reward value and cost, actual rewards offered, and their compatibility with the focal brand. For example, O'Brien and Jones (1995) suggest reward ratio, variety of reward redemption options, and aspirational value of rewards as important considerations. Kivetz and Simonson (2002) test the aspirational value aspect in an experimental setting and find its effects to be moderated by effort requirement. A luxury reward is preferred when effort requirement is high, whereas a less aspirational necessity reward is preferred when effort requirement is low. A few studies have considered the congruence between rewards offered and the focal brand and find that, in general, brand-congruent rewards are more effective than incongruent rewards, though this effect is moderated by factors such as consumer involvement and promotional reactance (Kivetz 2005; Roehm, Pullins, and Roehm 2002; Yi and Jeon 2003). Focusing more from a firm strategy perspective, Kim, Shi, and Srinivasan (2001) use game theory to identify the optimal conditions for offering cash versus free products as rewards. They find that the former is better if there are few price-sensitive heavy buyers, whereas the latter is more effective when the heavy buyer group is large or not very price sensitive.

In addition to program design factors, research has shown the impact of program management on the success of a loyalty program. For example, from a survey of 180 retailers, Leenheer and Bijmolt (2008) conclude that the success of a loyalty program is affected by the effort spent on capturing and analyzing consumer intelligence derived from the program. It may be surmised that the success of a loyalty program also depends on organizational support of the program and the amount of resources dedicated to program management, but these organizational factors have not been subject to empirical testing.

Consumer characteristics. Although proper program design and management are critical, it is consumers' reactions to a loyalty program that ultimately determine program success. Fewer studies have examined the impact of consumer characteristics on loyalty program effects. Consumer characteristics can be crudely classified into firm-specific attitudinal and behavioral factors versus traits and characteristics that carry across firms. In the former category, Lal and Bell (2003) and Liu (2007) examine the moderating effect of consumers' usage levels. Contrary to traditional wisdom of loyalty programs as a defense mechanism mainly for heavy buyers, these studies find the biggest increase in spending and purchase frequency among light buyers. This is attributed to loyalty programs' ability to eliminate cherry-picking (Lal and Bell 2003) and to encourage cross-selling (Liu 2007). Within this category of studies, Kivetz and Simonson (2003) also examine the effect of perceived effort advantage. Rather than treating point threshold as a program design factor, as we discussed previously, Kivetz and Simonson find that it is not the effort required per se but the perceived effort advantage a consumer has over other consumers that affects his or her likelihood of joining a program. This perceived effort advantage again can be driven by consumers' usage levels. However, note that this effort advantage effect may drive program joining decisions but may not carry over to what consumers do after they have joined a program.

Additional studies have segmented consumers according to their generic traits or characteristics, such as sociodemographics (Leenheer et al. 2007), shopping orientation (Magi 2003), future orientation (Kopalle and Neslin 2003), variety seeking (Zhang, Krishna, and Dhar 2000), and price sensitivity (Kim, Shi, and Srinivasan 2001; Kopalle et al. 2007). However, few of these factors have received empirical support. This may be attributed to the overgeneralized nature of these variables. So far, two factors, future orientation and price sensitivity, have received some support. Because loyalty programs reward consumers' current behavior at some point in the future, it is not surprising that such programs are found to be more appealing to consumers who do not heavily discount future benefits (Kopalle and Neslin 2003). Corroborating this view, Lewis (2004) finds that treating consumers as dynamically oriented better explains their purchase decisions in the presence of a loyalty program. The second factor, price sensitivity, has been found to moderate consumers' reactions to program design elements (Kopalle et al. 2007).

Overall, existing studies of consumer-related factors appear to suggest that firm-specific behavior and attitudes are better predictors of consumer reaction to a loyalty program. However, further research is needed to identify and test other consumer traits before a final conclusion can be drawn. We also note that though consumer-related factors have been mainly used to explain differential responses to the same loyalty program, they can also contribute to the diverse performances across programs by considering the varying composition of program members. Examples of this approach can be found in two game-theoretic models related to loyalty programs (Kim, Shi, and Srinivasan 2001; Zhang, Krishna, and Dhar 2000), in which individual characteristics, such as variety seeking and price sensitivity, are translated into market characteristics.

Competition-related factors. One problem with considering only program- and consumer-related factors is that it puts the program-offering firm and consumers in an isolated setting. In reality, however, most loyalty programs face competition from rival programs that offer similar benefits, and enrollment in multiple programs is common. In the retail industry, for example, consumers hold an average of three loyalty program cards (Meyer-Waarden 2007). This has led to the suggestion that firms need to "take into account cardholders' 'card portfolios' when evaluating the effectiveness of loyalty programs" (Magi 2003, p. 104). However, research on this type of influence is the scarcest, as is apparent in the shortest list of published studies in this set shown in Figure 1. A majority of existing studies have examined a single loyalty program in isolation. Among the few studies that have considered simultaneously the performances of multiple loyalty programs (e.g., Leenheer et al. 2007; Meyer-Waarden and Benavent 2006), most treat the programs as parallel strategies and do not explain the interaction among those programs.

Only four published studies have considered loyalty programs in a competitive setting. Two of these studies (Magi 2003; Meyer-Waarden 2007) find that consumers' holding loyalty program cards from competing chains reduces the share of wallet and customer lifetime for the focal chain. However, they do not consider the direct effect of competition on program performance, nor do they identify the reasons for competitive influence. Two earlier studies offer more specific examination of loyalty program competition and study the effect of firm-level factors. Nako (1992) analyzes travel records from three firms in the Philadelphia and Baltimore metropolitan areas. The results show that the value of a frequent-flier program increases with the airline's share in a traveler's main airport, suggesting the influence of a firm's market position on the success of its loyalty program. Along similar lines, Kopalle and Neslin (2003) model loyalty program competition and demonstrate that free rewards offered by firms charging higher prices are valued more by consumers. However, this proposition is not empirically tested and is likely to be constrained by model assumptions about market conditions and consumer behavior.

Summary

With limited research on loyalty programs, it is still unclear to what extent loyalty programs are effective and, more important, what induces the success and failure of different programs. Although some studies have examined the moderating effects of program and consumer characteristics, existing research tends to put a loyalty program in a vacuum that is void of impact from rival firms and programs. This omission of competitive influence is undesirable; prior research has shown that myopic profit maximization without considering competition can lead to suboptimal firm decisions (e.g., Carpenter et al. 1988). It also counters the marketplace reality of loyalty program proliferation within many industries. Questions still remain as to whether competitive loyalty programs in such industries really cancel one another's effects out, creating a zero-sum game, or whether some firms may enjoy asymmetric advantages with their loyalty programs due to their competitive positioning. Answers to these questions are critical to a complete understanding of loyalty programs. Incorporating competition will also offer more useful decision support to loyalty program managers and to firms that are pondering the establishment of a new loyalty program in the presence of existing rival programs.

Research Hypotheses

This research aims to bridge the gap in the literature by examining how competitive forces affect the business impact of a loyalty program. Although there are multiple measures of loyalty program effectiveness, we focus on firm-level sales, which have been found to be a key driver in the establishment of loyalty programs (Baird 2007). To study loyalty program competition, we draw from the resource-based view of the firm (Wernerfelt 1984), which argues that each firm possesses a unique set of tangible and intangible resources that determine its relative position in competition. From this perspective, a loyalty program plays two roles. First, it represents a unique firm resource that encompasses elements such as program members, program currency, and program loyalty. The program currency component, for example, can be traded to other firms for revenue or can be used in pricing that has been shown to excel over purely monetary-based pricing (Drèze and Nunes 2004). Second, a loyalty program embodies a distinct capability that enables a firm to deliver superior value to its customers, as demonstrated by the consumer benefits we discussed previously. Moreover, because a loyalty program captures essential consumer information that may be difficult to trace otherwise, it also belongs to the market-sensing capability that is considered essential to market-driven firms (Day 1994). These capabilities can help a firm obtain other essential resources, such as new customers and brand loyalty.

Although loyalty programs are important firm resources, the resource-based view also suggests that not all resources result in competitive advantage (Day 1994, Wernerfelt 1984) Our study of loyalty program competition builds on two key constraints on the effectiveness of a resource (1) the rarity of the resource in the market (Hunt and Morgan 1995, Wernerfelt 1984) and (2) the presence of other complementary resources and capabilities that help firms realize the full potential of the resource (e g , Moorman and Slotegraaf 1999) Specifically, we argue that the effectiveness of a loyalty program depends on the prevalence of such programs and that some firms enjoy an undue advantage with their loyalty programs over their competitors because of other complementary resources they possess By considering these market- and firm-related factors, we account for the dynamics among rival loyalty programs and thus put the programs in a more realistic setting As we demonstrate subsequently, these factors can help explain the diverse findings in existing research

Asymmetric Influences of Loyalty Programs: Market Share Effect

From our previous discussion of loyalty program benefits, we begin with the assumption that a loyalty program can increase firm revenue However, we argue that such benefits do not manifest equally in all firms and that some firms gain more from their loyalty programs than others Such asymmetric performances across firms are an important market phenomenon, and understanding such asymmetries is considered key to brand management (Sivakumar 2004)

Focusing on competitive factors, we argue that the disparity in loyalty program performance can be at least partially attributed to the different market positions of program-offering firms Whereas market position encompasses many factors, here we examine the effect of market share We choose to focus on market share because it is an important indicator of market structure and of a firm's market power (Wood 1999) Although market share has most often been treated as an outcome of rather than an input into competition, prior research has also shown unique resource advantages that can be attributed to having a larger market share, such as customer loyalty, lower costs, and channel benefits (Besanko, Dubé, and Gupta 2005, Boulding and Staelin 1993, Fader and Schmittlein 1993, Sethuraman 1995) Although we do not claim that high-share brands are always better off than low-share brands, existing research has shown that in certain situations, high-share brands enjoy more asymmetrical advantages than low-share brands

Extending the literature, we argue that loyalty programs can also favor high-share brands over low-share brands This is due to two crucial complementary resources that high-share brands enjoy customer assets and product resources From a customer assets perspective, high-share brands have more buyers, thus providing a larger customer base from which to draw loyalty program members Furthermore, high-share brands tend to enjoy higher purchase frequency and higher repeat purchase rates from consumers (Ehrenberg, Goodhardt, and Barwise 1990, Fader and Schmittlein 1993) This increases the relevance of the loyalty program to consumers (O'Brien and Jones 1995) and, combined with a larger customer base, creates a critical mass of program participants More customers also bring more potential publicity for the loyalty program

From a product resources perspective, high-share brands are likely to have a more diverse product portfolio and wider distribution channels to which consumers have access In the airline industry, for example, major airlines offer more routes to more destinations than their smaller opponents This creates more opportunities for earning program currency and again increases the relevance of the program to consumers (Nako 1992, O'Brien and Jones 1995) Furthermore, high-share brands may have an advantage when program rewards are in the form of free or discounted products With the exception of niche luxury brands, a free product from a larger brand is likely to be perceived as more valuable than that from a smaller brand (Kopalle and Neslin 2003) The diverse product portfolio likely to be offered by a high-share brand also increases the variety of redemption choices Whereas the actual redemption choices available to consumers are limited by program design, a diverse product portfolio still gives high-share firms more options to consider when designating which products to offer as rewards Finally, high-share firms also possess the critical mass to draw strategic program partners, as in the case of major airlines offering a wide range of rewards, from free hotel nights to magazines and retail gift certificates This increases the appeal of the programs With the help of all these complementary resources, we expect that the impact of a loyalty program is greater for a firm with a higher market share than for a firm with a lower market share Thus

> H_1 The impact of a loyalty program is affected by a firm's market share, such that a program offered by a high-share firm has a greater impact on the firm's sales than a program offered by a low-share firm

Market Saturation Effect

We further argue that the impact of a loyalty program is limited by competitive offerings in the market From a consumer utility perspective, a loyalty program offers additional return in the form of rewards and thus shifts the distribution of value among competing firms in favor of the loyalty program firm If competing firms do not adjust their strategies accordingly, this can create a redistribution of consumers in the market However, if the market offers many rival loyalty programs, the novelty and value advantage of a single program diminishes Moreover, the accumulated points consumers have in other programs become barriers to switching because consumers must either forsake those points or delay their progress toward a reward because of divided efforts among multiple programs (Kim, Shi, and Srinivasan 2001) This is referred to as the lock-in effect of loyalty programs (Sharp and Sharp 1997) The lock-in effect makes it more difficult for a firm to excel over competition in its value proposition by offering a loyalty program Although this may not affect loyalty programs as a viable strategy for an industry as a whole, at the firm level, the impact of a loyalty program is likely to decrease as a result of market saturation

From a strategic resources perspective, a loyalty program loses its position as a unique resource when such programs become more commonplace in the market This view is consistent with Day (1994), who emphasizes the importance of "distinctive" capabilities in securing a unique and superior market position Scarcity of a capability is a necessary condition for the capability to become a source of competitive advantage and for the durability of such advantages In line with this thinking, when many competitors offer loyalty programs, the distinct value the program provides to each firm should diminish Thus

> H_2 The sales impact of an individual loyalty program diminishes with the level of saturation of loyalty programs in the marketplace

Study 1

Data

We test our hypotheses using data from the airline industry We selected this industry context for a few reasons First, as the pioneer of modern loyalty programs, the airline industry is still the current market leader in terms of loyalty program enrollment, claiming a total membership of more than 254 4 million in 2006 (Ferguson and Hlavinka 2007) Many loyalty programs in other industries have been modeled after the airline industry, using similar program design and reward structures Second, there is intense competition among airlines' loyalty programs as a result of the large number of programs offered, making it an ideal context for studying loyalty program competition Furthermore, because frequent-flier programs are designed similarly across airlines, it helps control for program design factors and isolate the effect of competition Finally, a longer loyalty program history and more publicly available statistics from the airline industry also offer rich data to study these programs Because a majority of previous studies in this area have focused on the retail industry, our focus on the airline industry broadens the scope of loyalty program research

Our analysis covers 22 publicly traded airlines in the United States over the course of 31 years (1975–2005) For each airline, we identified the availability and launch of its loyalty program from sources such as company Web sites, public release, annual reports, business news, and other public databases Of the 22 airlines, 15 offered a loyalty program The earliest one was American Airlines' AAdvantage program, which was launched in 1981, and the most recent one was Big Sky Airlines' MVP Club, which was established in 2004 In addition to loyalty program information, we obtained the airlines' financial data from COMPUSTAT, revenue passenger miles (RPMs), capacity, and segmentation data from the Bureau of Transportation Statistics, and airfare information from the Air Transport Association

The Model

To test our hypotheses, we modeled the impact of loyalty programs and competitive factors on each airline's annual sales as in Equation 1

$$\text{(1) } \text{Sales}_{it} = \alpha_0 + \alpha_1 \text{LP}_{it} + \alpha_2 \text{LP}_{it} \times \text{MS}_{i(t-1)} + \alpha_3 \text{LP}_{it} \times \text{Sat}_t + \alpha_4 \text{Adv}_{it} + \alpha_5 \text{Price}_t + \alpha_6 \text{Sales}_{i(t-1)} + e_{it},$$

where

Sales_{it} = firm i's annual inflation-adjusted sales in dollars at time t (t – 1),
LP_{it} = 1 if firm i has a loyalty program at time t and 0 if not,
$\text{MS}_{i(t-1)}$ = size of firm i as measured by its market share (ratio of its RPMs to industry RPM total) at the end of time t – 1 (i e , at the beginning of t),
Sat_t = loyalty program saturation at time t as measured by the combined market share covered by all loyalty program–offering firms in the marketplace,
Adv_{it} = firm i's inflation-adjusted spendings on advertising and promotion in dollars during time t,
Price_t = average inflation-adjusted airfare in dollars reported for time t, and
e_{it} = the residual term

The first dummy variable, LP_{it}, represents the pure effects of firm i's own loyalty program without any competition, and its coefficient, α_1, should be positive if a loyalty program is indeed effective in boosting the offering firm's sales We capture the size effect (H_1) by the $\text{LP}_{it} \times \text{MS}_{i(t-1)}$ interaction term To reduce correlation with sales, we used the airlines' RPMs to derive market share The Bureau of Transportation Statistics defines an RPM as "one revenue passenger transported one mile in revenue service" (http // www transtats bts gov/Glossary asp), this is a better indicator of an airline's weight in the passenger travel market We calculated each airline's market share at time t by dividing its domestic RPMs at time t by industry total for that period Because larger firms are expected to benefit more from their loyalty programs, the coefficient for this interaction term (α_2) should be positive The $\text{LP}_{it} \times \text{Sat}_t$ interaction represents the moderating effect of market saturation (H_2) We operationalized saturation as the sum of market shares of all firms that had a loyalty program at time t In other words, Sat_t represents the portion of the market that is covered by loyalty programs at time t Thus, the interaction between LP_{it} and Sat_t indicates the dilution of firm i's program impact due to saturation of loyalty programs in the marketplace and is expected to have a negative effect on sales (i e , $\alpha_3 < 0$)

In addition to loyalty program and competition-related variables, we included two control variables Adv_{it} represents firm i's advertising and promotional spending, and Price_t controls for the effect of price fluctuation Because historical data on individual airlines' prices are not available, we used the inflation-adjusted average passenger airfare, as reported by the Aviation Transportation Association Finally, the model also contained a lagged sales term to capture the effects of past sales on the current period

Model Estimation

Because a firm's decision to launch a loyalty program may be affected by the firm's past sales and/or factors that simultaneously drive sales, the LP_{it} variable may be endogenous This can lead to incorrect estimates To address this issue, we followed Wooldridge's (2002) recommended approach and used instrumental variables, whose requirements are that they can explain LP_{it} but have minimal correlation with the original model residual Specifically, we used two lagged instrumental variables load factor and market concentration The airline industry uses the first variable, load factor ($LoadFactor_{it-1}$), to indicate the extent to which an airline's available capacity is occupied by paid passengers It is calculated as the ratio of the airline's RPMs to the airline's total available seat miles Because an airline with a low load factor (i e , more vacant capacity) is likely to have more room for reward travel and to be more eager to fill its seats, we expect that load factor affects loyalty program launch negatively

The second instrumental variable, market concentration (HHI_{it-1}), measures the extent to which a market is dominated by a few large firms and is often calculated as the Hirschman–Herfindahl index (HHI) in the economics literature (Kwoka 1977) The HHI is the sum of squared market shares for all firms in the market and is bound between 0 and 1 in its normalized form A high HHI indicates low competitive intensity, and a low HHI indicates high competitive intensity Although an HHI could be calculated for the entire airline industry, this industry HHI would not be helpful to us, because it would be the same for all airlines and would not explain differences in firms' loyalty program launch decisions Therefore, we calculated segment-level HHIs The Bureau of Transportation Statistics segments airlines according to their sizes and operational regions Using this segmentation, we identified all airlines operating in each segment, calculated the yearly segment share of each airline using RPMs, and then derived the normalized HHI for each segment in each year Prior research has suggested that stronger competitive intensity is likely to induce the establishment of loyalty programs (Leenheer and Bijmolt 2008) Therefore, we expect that a low level of HHI (i e , high competitive intensity) leads to more loyalty program launch

Following Wooldridge's (2002) recommended two-stage least squares approach, we first regressed the two instrumental variables together with the other independent variables from the main model on LP_{it} A unique nature of the LP_{it} variable is that it is only endogenous in some cases This is because when a loyalty program is launched, it is likely to continue for the following years Therefore, although the decision to launch a loyalty program may be endogenous, the LP_{it} following a program launch becomes a constant and thus is no longer endogenous (Wooldridge 2002) To accommodate this, we constrain LP_{it} to 1 if firm i had a loyalty program before time t and used the instrumental variables only for the cases in which a loyalty program did not already exist before time t, as shown in Equation 2

$$(2)\quad LP_{it} = \begin{cases} \beta_0 + \beta_1 LoadFactor_{it-1} & \\ + \beta_2 HHI_{it-1} + \beta_3 MS_{i(t-1)} & \\ + \beta_4 Sat_t + \beta_5 Adv_{it} & \\ + \beta_6 Price_t + \beta_7 Sales_{i(t-1)} & \text{if } LP_{i(t-1)} = 0 \\ 1 & \text{if } LP_{i(t-1)} = 1 \end{cases}$$

In the second stage, we used the predicted values for LP_{it} in lieu of the original values to estimate the main model (Leenheer et al 2007) Because our data were both cross-sectional and longitudinal in nature, we estimated our model using panel regression, which accounts for firm idiosyncrasies[1] Two approaches are often used in panel regression fixed-effects models and random-effects models (Wooldridge 2002) Fixed-effects models estimate a firm-specific constant to captures firm heterogeneity, whereas random-effects models assume that firm variations are randomly distributed across the population In general, random-effects models are more efficient but can lead to biased estimates when firm-specific effects are correlated with other regressors in the model In such cases, fixed-effects models are needed to obtain consistent results We used the Hausman (1978) test to detect the appropriateness of fixed- versus random-effects specifications, which suggests that fixed-effects panel regression was more appropriate for our data ($\chi^2 = 23\ 57, p < \ 001$) Consequently, we fitted a fixed-effects model Furthermore, to eliminate collinearity among the predictor variables in the model, we mean-centered all variables in the interaction terms (for the correlation matrix, see Table 1)

Results

Table 2 shows the results for both stages of regression The R-square for the first-stage model was 82 Both instrumental variables had a low and insignificant correlation with the residuals from the original model (for load factor, $r = \ 03$, and for market concentration, $r = \ 06$, $ps > \ 3$), suggesting that they were appropriate choices as instrumental variables As we expected, load factor had a significant, negative effect on loyalty program launch ($\beta_1 = -42$, $p = \ 02$) Market concentration also had a negative effect on LP_{it} ($\beta_2 = -09$, $p = \ 04$), suggesting that the decision to launch a loyalty program is more likely under more intensively competitive environments

The R-square for the second-stage model was 97 The results showed an insignificant coefficient for LP_{it} ($\alpha_1 = \ 01$, $p = \ 69$) Because we mean-centered the interactions, this coefficient represents the main effect of loyalty program when the other interacting variables are at their mean

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[1] Firms can also be affected simultaneously by events from a specific year, leading to correlated errors across firms This could create biased estimates To determine whether this was the case, we estimated a two-way fixed-effects model that takes into account both firm- and time-specific effects The substantial findings remained the same Here, we report the results from the one-way fixed-effects model, because the two-way model makes it impossible to estimate the effect of the firm-invariant price variable

TABLE 1
Correlation Matrices

A: Study 1

	Sales$_{it}$	LP$_{it}$	LP$_{it}$ × MS$_{i(t-1)}$	LP$_{it}$ × Sat$_t$	Adv$_{it}$	Price$_t$	Sales$_{i(t-1)}$
Sales$_{it}$	1						
LP$_{it}$	09$^{n s}$	1					
LP$_{it}$ × MS$_{i(t-1)}$	13**	19***	1				
LP$_{it}$ × Sat$_t$	06$^{n s}$	11*	– 24***	1			
Adv$_{it}$	57***	35***	18***	10$^{n s}$	1		
Price$_t$	00$^{n s}$	00$^{n s}$	00$^{n s}$	00$^{n s}$	00	1	
Sales$_{i(t-1)}$	76***	15**	33***	10$^{n s}$	83***	00$^{n s}$	1

B: Study 2[a]

	Frequency$_{ij}$	LP$_{ij}$	LP$_{it}$ × MS$_j$	LP$_{it}$ × Sat$_i$	LP$_{ij}$ × Sat$_i$ × Expandibility$_i$	Loyalty$_{ij}$
Frequency$_{ij}$	1					
LP$_{ij}$	20***	1				
LP$_{it}$ × MS$_j$	11***	07**	1			
LP$_{it}$ × Sat$_i$	08***	76***	09***		1	
LP$_{ij}$ × Sat$_i$ × Expandibility$_i$	11***	56***	04$^{n s}$	75$^{n s}$	1	
Loyalty$_{ij}$	28***	55***	18***	13***	12***	1

*$p \leq$ 05
**$p \leq$ 01
***$p \leq$ 001

[a] Some of the correlations reported here are relatively high The mean-centering approach we used has been criticized for not necessarily solving multicollinearity An often-used alternative approach is to orthogonalize the interaction terms by regressing each interaction term on its composing variables and using the residuals in the main regression (Burrill 1997) This orthogonalization approach yielded similar findings for our model Here, we report the results from the mean-centering approach because it allows for simpler interpretation and testing of linear combinations of regression coefficients

Notes n s = not statistically significant

TABLE 2
Standardized Model Estimates

A: Study 1

First Stage		Second Stage	
Variables	Coefficients (t-Values)	Variables	Coefficients (t-Values)
LoadFactor$_{i(t-1)}$	– 42* (–2 39)	LP$_{ij}$	01$^{n s}$ (40)
HHI$_{i(t-1)}$	– 09* (–2 05)	LP$_{ij}$ × MS$_j$	10*** (5 84)
MS$_{i(t-1)}$	– 71*** (–5 69)	LP$_{ij}$ × Sat$_i$	03$^{n s}$ (1 37)
Sat$_{it}$	– 07$^{n s}$ (–1 05)	Adv$_{it}$	22*** (6 85)
Adv$_{it}$	74*** (6 93)	Price$_t$	– 24*** (–9 95)
Price$_t$	– 39* (2 42)	Sales$_{i(t-1)}$	34*** (10 08)
Sales$_{i(t-1)}$	03$^{n s}$ (64)		
Adjusted R^2	82	Adjusted R^2	96

B: Study 2

First Stage		Second Stage	
Variables	Coefficients (t-Values)	Variables	Coefficients (t-Values)
LoyaltyProne$_i$	– 06** (–2 49)	LP$_{ij}$	17*** (3 35)
MS$_j$	02$^{n s}$ (91)	LP$_{ij}$ × MS$_j$	08*** (3 45)
Sat$_i$	23*** (9 87)	LP$_{ij}$ × Sat$_i$	– 16** (–3 03)
Expandability$_i$	– 01$^{n s}$ (– 35)	LP$_{ij}$ × Sat$_i$ × Expandability$_i$	11** (4 78)
Loyalty$_{ij}$	15*** (6 28)	Loyalty$_{ij}$	16*** (3 16)
Adjusted R^2	08	Adjusted R^2	12

*$p \leq$ 05
**$p \leq$ 01
***$p \leq$ 001
Notes n s = not statistically significant

levels In other words, our finding means that loyalty programs had no significant effect on sales at an average market share (5 6% in our case) and with program saturation at the mean level (60 6% of market) It is possible to transform this coefficient into an absolute effect when the values of the moderator variables are zero This also revealed an insignificant effect of LP_{it} (F < 1) Overall, loyalty programs by themselves did not create incremental sales for the airlines

In contrast, the coefficient for $LP_{it} \times MS_i$ was significant and positive ($\alpha_2 =$ 10, $p <$ 001), in support of H_1 When we combine this finding with the insignificant main effect of LP_{it}, the results suggest that firms in a parity competitive position do not benefit significantly from their loyalty programs Only when firms have a larger market share and, therefore, a superior combination of complementary resources do loyalty programs become a beneficial strategy, at least from an incremental sales perspective To understand the size of this effect, we turn to the unstandardized regression coefficient, which shows that a 1% increase in market share from the average of 5 6% brings a loyalty program–induced annual sales lift of $309 57 million (in 2005 dollars) Although this magnitude of gain is impressive, it is necessary to consider it in the context of the airline industry, which typically reports large sales figures For example, Continental Airlines, which had an 8 6% share in the passenger travel market in 2005, reported total sales of $11 21 billion Using the results from our model, we can infer that $928 71 million (8 28%) of its sales may be attributed to its loyalty program Table 3 lists the effect size for the top six airlines

Although the gains from loyalty programs for high-share firms are large, H_2 predicted that the concurrent existence of other loyalty programs should lessen the impact of a firm's loyalty program as a result of market saturation We captured this moderating effect of market saturation with the $LP_{it} \times Sat_t$ term Contrary to prediction, however, our analysis revealed an insignificant coefficient of the interaction term ($\alpha_3 =$ 03, $p =$ 17) This is surprising Despite much speculation that the prevalence of loyalty programs essentially creates a zero-sum game, our findings show that saturation of frequent-flier programs does not significantly mitigate the effects of such programs We explore this anomaly further in Study 2

For the control variables, we found the expected positive effect of advertising and promotion ($\alpha_4 =$ 22, $p <$ 001), consistent with the notion that a firm benefits from spending on advertising and promotional activities As we also expected, the price variable had a significant, negative effect on sales ($\alpha_5 = -$ 24, $p <$ 001) The coefficient for the sales lag variable was significant and positive ($\alpha_6 =$ 34, $p <$ 001) Because the coefficient was lower than 1, it suggests that the impact of past sales diminishes over time, consistent with observed sales patterns in previous research (Hanssens, Parsons, and Schultz 2001)

Discussion

Study 1 found an insignificant main effect of loyalty programs on airline sales Instead, the results suggest that a loyalty program has a positive impact only when the offering firm's market share is relatively high, consistent with our notion that firms need complementary resources to derive competitive advantage from their loyalty programs A surprising finding from the study is that market saturation did not significantly reduce the effectiveness of loyalty programs This may explain the proliferation of loyalty programs in the airline industry Four of the airlines we studied launched their loyalty programs after 2000 Although this finding lends support to such practices, it is unclear why loyalty programs did not become a zero-sum game, as prior research has predicted Does the rule of scarcity not apply to loyalty programs? Are there other variables that might have mitigated the negative effect of saturation? We answer these questions in Study 2 Study 2 also addresses a limitation in Study 1 that resulted from the use of firm-level aggregate data Because airlines can derive revenues from other business areas, the sales figures may be affected by confounding factors from those areas

Study 2

Overview

The goals of Study 2 were twofold to test the robustness of the findings from Study 1 with a dependent variable other than firm-level sales and to identify the factors that might have mitigated the effect of market saturation Specifically, we consider the contingency effect of category expandability (Kopalle and Neslin 2003), which refers to the presence of alternative product choices outside a category (e g , other modes of travel) Using game-theoretic modeling, Kopalle and Neslin (2003) conclude that loyalty programs are more appealing in expandable markets because they can help the offering firms draw demand from outside the category

TABLE 3
Effect Size of Loyalty Programs for Top Six Airlines in 2005

Airline	Sales (in Millions of Dollars)	Market Share (%)	Inferred Sales Gain from Loyalty Program (in Millions of Dollars)	% of Sales Gain
American	20,712	17 40	3,652 93	17 64
United	17,379	14 37	2,715 43	15 62
Delta	16,191	13 05	2,305 40	14 24
Northwest	12,286	9 55	1,222 26	9 95
Continental	11,208	8 60	928 20	8 28
Southwest	7,584	7 59	615 91	8 12

Applied to the saturation effect, if a product category is highly expandable, it can be surmised that saturation will be less of a threat because loyalty programs can still help firms compete effectively against alternative offerings from other industries. In other words, a highly expandable market opens up the boundary of competition, and as a result, prevalent resources within the narrow market can still lead to competitive advantage if the resources are scarce in other parts of the wider market.

Kopalle and Neslin (2003) test the category expandability effect at an industry-subgroup level using combined performances of all major airlines. They find continuing benefits of frequent-flier programs for the major airlines as a whole even when multiple programs were offered, which they attribute to the ability of these programs to defend major airlines against new low-cost entrants. In this research, we extend their study to examine the effect of category expandability on individual loyalty programs. We further argue that though category expandability was originally suggested as a market-level characteristic, its effect also exists at the individual level. Because of individual preferences (e.g., fear of flying) and purchase habits (e.g., traveling very little), the expandability of a product category may differ among consumers. For consumers with high category expandability, loyalty programs can draw demand from other categories. Consequently, enrolling in multiple programs may not necessarily erase the influence of an individual program on these consumers. In contrast, for consumers whose market boundaries are more rigid, the saturation effect should be more pronounced as multiple programs compete for a fixed demand. Thus,

> H_3: The market saturation effect specified in H_2 is more pronounced for consumers with low category expandability than for consumers with high category expandability.

Data

To collect the data for this study, we conducted an online survey of a convenience sample of 166 consumers. The sample comprised 48.8% men and 51.2% women. The age of the respondents varied between 19 and 54 years, with an average age of 24.35 years. The median household income was between \$50,000 and \$74,999. These consumers traveled an average of 3.32 times per year. For the mode of air travel, the average frequency was 1.36 times per year. A majority (82.6%) of the respondents said that they travel mainly for personal reasons. An equal number of the other consumers reported that they mainly travel either for business reasons or for a mixture of personal and business reasons. To avoid overwhelming consumers, our survey focused on the top 11 U.S. airlines, all of which offered a loyalty program. The respondents reported their frequency of flying with each of these airlines in the past year and their membership in the airlines' loyalty programs. For each airline, we also measured the consumers' attitudinal loyalty using Chaudhuri and Holbrook's (2001) two-item scale. The scale asked consumers how committed they are to an airline and the extent to which they are willing to pay more for flying with an airline over other airlines. We measured these responses on eight-point semantic differential scales and averaged the responses to the two items to form an overall attitudinal loyalty score ($\alpha = .75$).

We operationalized category expandability by measuring consumers' purchase frequency in the travel "supercategory" (including air and other modes of travel) in a typical year. The rationale is that consumers who have higher demand for a supercategory (i.e., travel) offer more room for the subcategories (i.e., air travel) within the supercategory to expand. In other words, for frequent travelers, there are more opportunities for airlines to expand into alternative travel options than for consumers who travel infrequently and thus have a more rigid demand for air travel. Our approach is consistent with prior research that shows increased portfolio size under higher category purchase rates (Colombo and Jiang 2002). We used a median split to convert each consumer's travel frequency into an expandability indicator.

The Model

To avoid the confounding influences on sales that we discussed previously, in this study, we used purchase frequency as the dependent variable. We show the model in Equation 3:

$$(3)\quad \text{Frequency}_{ij} = \alpha_0 + \alpha_1 LP_{ij} + \alpha_2 LP_{ij} \times MS_j + \alpha_3 LP_{ij} \times Sat_i + \alpha_4 LP_{ij} \times Sat_i \times \text{Expandability} + \alpha_5 \text{Loyalty}_{ij} + e_{ij},$$

where

Frequency_{ij} = the number of times consumer i flew with airline j in the past year,
LP_{ij} = 1 if consumer i belongs to airline j's loyalty program and 0 if not,
MS_j = airline j's market share during the reference period of the survey (taken from Study 1 data),
Sat_i = total number of frequent-flier programs consumer i is enrolled in (i.e., program saturation),
Expandability_i = 1 if category expandability is high for consumer i and 0 if low, and
Loyalty_{ij} = consumer i's self-reported attitudinal loyalty to airline j.

To accommodate systematic variations within consumers and within airlines, we adopted an approach similar to panel regression by specifying the residual structure as in Equation 4:

$$(4)\quad e_{ij} = v_i + u_j + \varpi_{ij},$$

where v_i represents the systematic effect for consumer i, u_j is the systematic effect associated with airline j, and ϖ_{ij} represents random error.

The coefficient for LP_{ij} shows the main effect of a loyalty program. Similar to Study 1, the $LP_{ij} \times MS_j$ interaction represents the size advantage we predicted in H_1, and we expect its coefficient to be positive. We capture the saturation effect by the interaction between LP_{ij} and Sat_i and the three-way interaction among LP_{ij}, Sat_i, and Expandability_i. The coefficient for the $LP_{ij} \times Sat_i$ term, β_3, symbolizes the saturation effect when category expandability is low (i.e.,

$Expandability_i = 0$) We expect it to be negative as a result of the market saturation effect (H_2) The three-way interaction represents the difference in saturation effects under high versus low category expandability (i e , $Expandability_i = 1$) If high category expandability truly mitigates the saturation effect, as we predicted in H_3, the coefficient for this interaction should be positive

Similar to Study 1, the model specified in Equation 3 may have an endogeneity problem because a consumer who travels more often with an airline may be more likely to join that airline's loyalty program To address this self-selection issue, we again estimated the model using two-stage least squares, as in Study 1 Consumers' relationship proneness served as an instrumental variable, which we measured with two items "I tend to buy things from the same companies," and "I prefer to buy from a company that knows me personally" We averaged these two items to form the relationship proneness score ($RelationProne_i$) In the first stage, we estimated Equation 5, which included the instrumental variable and all variables from the main model We then used the predicted value for LP_{ij} in the second-stage regression

$$(5) \qquad LP_{ij} = \alpha_0 + \alpha_1 RelationProne_i + \alpha_2 MS_j + \alpha_3 Sat_i + \alpha_4 Expandability_i + \alpha_5 Loyalty_{ij} + \xi_{ij}$$

Results

Table 2 provides the estimates from both stages of regression The R-square for the first-stage model was 08 The results show a negative effect of relationship proneness on loyalty program membership ($\alpha_1 = -06$, $p = 01$) We expected this finding because consumers who have the tendency to develop deeper relationships with firms are less likely to shop among many loyalty programs or to rely solely on loyalty programs as incentives for doing business with a firm Further confirming the suitability of our choice of instrumental variable, relationship proneness had an insignificant correlation ($r = -02$) with the residuals from the original model when we did not account for endogeneity (Wooldridge 2002) Not surprisingly, our data also showed a significant effect of attitudinal loyalty on loyalty program membership ($\alpha_5 = 15, p < 001$)

The second-stage model accounted for 12 17% of the variance in the dependent variable (for the correlation matrix, see Table 1, Panel B) The results showed that membership in an airline's loyalty program contributed positively to the frequency of flying with the airline ($\beta_1 = 17$, $p < 001$) Although this differs from the insignificant loyalty program main effect we found in Study 1, recall that this survey was based on the 11 largest airlines Therefore, from the market share advantage perspective, this subset of airlines is more likely to benefit from loyalty programs In support of this market share hypothesis (H_1), our analysis revealed a positive coefficient for the $LP_{ij} \times MS_j$ interaction term ($\beta_2 = 08, p < 001$)

Consistent with H_2, a significant, negative effect of the $LP_{ij} \times Sat_i$ interaction emerged ($\beta_3 = -16$, $p = 002$), suggesting that market saturation dilutes the impact of individual loyalty programs when category expandability is low Furthermore, the $LP_{ij} \times Sat_i \times Expandability_i$ term was significant and positive ($\beta_4 = 11, p = 002$) A test of the combined coefficients for the two interaction terms after we adjusted for mean centering revealed an insignificant overall effect ($F = 1\ 33, p = 25$) on high-category-expandability consumers Combined with the insignificant effect of market saturation from Study 1, our results indicate that there may be a significant portion of consumers with high category expandability in the air travel market and that the demand for air travel is relatively flexible Overall, H_3 was supported Our results provide further proof to Kopalle and Neslin's (2003) proposition that loyalty programs are more viable in expandable markets Beyond a possible "me-too" motivation, loyalty programs are appealing to airlines even under high saturation because they enable airlines to compete effectively with other substitutes (including other modes of transportation and the choice of not traveling at all)

As we would expect, the coefficient for the attitudinal loyalty variable was significant and positive ($\beta_5 = 16, p < 001$), suggesting a positive effect of brand loyalty on consumer patronage behavior When we eliminated the loyalty variable from the model, the coefficient for the LP_{ij} variable increased, suggesting that the effects of a loyalty program are partially mediated by enhanced attitudinal loyalty toward the offering firm (Baron and Kenny 1986) However, that the presence of attitudinal loyalty in the model did not completely eliminate the effect of loyalty program membership suggests that a loyalty program also directly affects consumer behavior beyond attitudinal loyalty, possibly in the form of pure economic incentives

Effect Size

To understand the magnitude of loyalty program effects, we used an approach similar to that of Leenheer and colleagues (2007), comparing a consumer's frequency of flying with an airline with a simulated situation in which the consumer does not belong to the airline's frequent-flier program Across all consumers, the frequency lift as a result of membership in a loyalty program was 4 24% The size of the frequency lift varied across airlines, from a negligible 03% for Frontier Airlines (the smallest in the group) to 11 57% for Southwest Airlines Overall, the magnitude of frequency lift attributable to loyalty programs traced closely to the rankings of the airlines based on their market share To observe how much saturation could dilute the frequency gain induced by an individual loyalty program, we simulated the scenario in which we increased each consumer's total loyalty program count by one Across all consumers, this additional program reduced the average frequency lift from loyalty programs to 2 3% When we split the sample by category expandability, the frequency lift for the low-expandability group reduced to only 1 08%, whereas the frequency lift for the high-expandability group remained almost unchanged at 3 80%

Discussion

Conclusions

Loyalty programs are an important customer relationship management tool However, the proliferation of such programs in the marketplace has spawned intense competition among rival programs In contrast to this market reality, existing studies of loyalty programs have often considered a single program in isolation and have ignored the effects of competition on program performance Addressing this gap in the literature, we draw from the resource-based view of the firm and identify competitive factors that affect the success of loyalty programs We argue that as a competitive firm resource, a loyalty program needs other complementary resources to realize its value fully and to create competitive advantage In support of this view, our two studies showed that loyalty programs did not always lead to beneficial outcomes for the offering firm and that only high-share firms experienced sales lifts from their loyalty programs Because high-share firms tend to possess complementary product and customer resources, they are more likely to gain from their loyalty programs than firms with a smaller market share

Our research also reveals that crowding the marketplace with loyalty programs can diminish the return of an individual program Although this finding may not be particularly surprising, we also find that this saturation effect is contingent on the expandability of the product category Market saturation has a negative effect under low category expandability, but its effect disappears under high category expandability When the products from one industry can be extended to meet the demands in related industries, the competitive landscape shifts to include not only competitors within an industry but also firms in those related industries From this broader perspective, although the imitation of loyalty programs among competitors makes it a common resource within the focal industry, such resources can still derive competitive advantage within the broader market if competitors in alternative categories do not yet possess such resources Under this situation, saturation becomes less of a threat to the success of each individual program in the focal industry Because of the airline industry's relatively high category expandability, the overall effect of market saturation becomes insignificant

Our results can explain some of the mixed findings in the loyalty program literature Although existing research does not offer enough information for us to assess market saturation, in general, the firm size and category expandability explanations we advanced in this study are consistent with prior findings For example, the two firms (Kmart and Shell) found to have benefited from the Fly Buys program in Sharp and Sharp (1997) both had the leading share in their respective product category As another example, in Leenheer and colleagues' (2007) study of seven loyalty programs in the grocery retail industry, in general, the more effective programs were offered by top firms in terms of market share Although two low-share retailers also experienced a large increase from having a loyalty program, they offered either a significantly higher reward ratio (4%) or a higher discount rate (9%) than their rivals, thus possibly overcoming their disadvantageous positions caused by low market share Similarly, in Meyer-Waarden and Benavent's (2006) study of six grocery stores, the three stores that benefited from their loyalty programs all belonged to the top two chains in the area

Our category expandability finding also explains the success of some loyalty programs documented in prior research For example, Drèze and Hoch (1998) examine a category-specific loyalty program within a supermarket chain The program was targeted at health and beauty care products, which the researchers argued to be an underdeveloped area in the supermarket industry and on which the industry was losing market share to retailers outside the industry This may have contributed to the tremendous success of the program by defending the supermarket and drawing demand from industry outsiders In another study, Lewis (2004) finds that an online retailer's loyalty program increased consumers' transaction size As a fast-growing medium, online retailing represents a highly expandable category that is quickly displacing traditional channels Loyalty programs offered in this new channel make it even more appealing to consumers and encourage them to buy more from this channel rather than from traditional stores

Managerial Implications

When a strategy is proved to be successful by some firms, it is easy for other firms to be tempted to follow the fad and copy the strategy in their own situation Our study cautions against an urge to launch a loyalty program simply because every other competitor is doing so Rather, a firm that is pondering the launch of such a program in an already-saturated market should carefully consider the flexibility of market demand and whether important resources exist to complement such a program If market demand is flexible, either because demand can be stolen from related industries or because additional demand can be stimulated from consumers (Nunes and Drèze 2006), saturation will be less of an issue, and loyalty programs can still be a viable strategy for expanding the firm's business In contrast, in a rigid market in which firms compete for a limited, fixed set of demand, offering more loyalty programs functions at best as a defense mechanism (Sharp and Sharp 1997), and their incremental contribution to the bottom line will be limited The end result will be a zero-sum game for the industry

For larger firms, such a defensive move can still be valid because it may be more important or realistic for such firms to maintain a dominant market share rather than trying to increase sales However, when the focus is more on growth, such as in the case of a relatively new brand, rather than launching a loyalty program, the firm will be better off examining its existing resources or identifying other resources it can acquire at a relative cost advantage This exercise may reveal resources and capabilities, such as superior customer service, that can add value to the firm's offerings and strengthen its relationship with customers Because these resources may be less imitable than loyalty programs, they can offer the firm long-term competitive advantage This strategic alternative is especially relevant to small players in the market because our analysis shows that these players lack the complementary resources to benefit truly from a loyalty program Therefore, unless smaller players have a long lead time ahead of their larger rivals to gain a large program base (an unlikely scenario), such a program may not be a wise move

A pragmatic matter in this strategic assessment of whether to launch a loyalty program is to determine how expandable the product category really is In this research, we used consumers' overall travel frequency as a proxy for individual demand expandability For industry-level assessments, however, this measure will have limited utility Instead, firms can derive demand elasticity from consumer purchase data Industry growth rate may also be helpful in this assessment Alternatively, primary research can be conducted with consumers to understand the substitutability of various product categories

For a firm that already operates a loyalty program, our research suggests that it is necessary to think beyond the design and management of the program itself The success of a loyalty program depends on other aspects of the firm as well as market dynamics Loyalty programs as a standalone mechanism do not necessarily bring competitive advantage but rather need a set of other resources to realize their value To prevent a loyalty program from becoming a mundane resource, a firm should focus on building complementary resources (either internally or through external acquisition) to increase the appeal of its program For example, technological and analytical capabilities can be combined with information gained from loyalty programs to enable one-to-one marketing to customers The essential idea is to create a unique combination of resources that maximize the appeal of a loyalty program beyond economic incentives When this occurs, although competitors can copy the loyalty program itself, they will lack the complementary resources to make the program equally competitive For small firms that already have a loyalty program, their disadvantageous position means that they may need to try special tactics, such as increasing reward ratio and offering more reward redemption options, to remain competitive with their loyalty program offerings Alternatively, they could seek less-size-sensitive resources (e g , niche product positioning) that may enhance the value of their loyalty programs

Limitations and Research Implications

We recognize a few limitations in our research that need to be addressed in future studies First, our research covers only a small portion of the loyalty program framework we proposed Many of the factors in the framework remain to be examined in further research At the market level, for example, in addition to category expandability, factors such as the degree of market or customer wallet fragmentation and the presence of switching barriers (e g , contractual versus noncontractual relationships) may influence the effectiveness of loyalty programs Furthermore, the three sets of factors in Figure 1 are likely to interact with one another, which we did not consider in the current research These questions are unlikely to be answered by a single study Rather, a systematic research program is needed to identify the effects of these factors as well as their interactions, similar to the types of work described by Nunes and Drèze (2006)

Second, the context of our research may limit its generalizability to other industries In particular, airlines' loyalty programs feature similar designs (e g , no participation fee, similar reward requirements), and airlines themselves also offer similar services with low switching barriers As a result, the market saturation effect we found in this study may be more applicable to industries with similar structures, such as hotel and credit card sectors In an industry in which competitors and their loyalty programs are highly differentiated and switching barriers between programs are high, the saturation effect is likely to be lower than the current findings The same applies to industries in which firm–customer relationships are usually contractual, such as in cell phone services However, we expect category expandability to continue to play a role in moderating the effect of program saturation because it is a cross-category factor representing the flexibility in demand that enables firms from one product category to compete effectively with other product categories The market share effect is also likely to hold because the need for complementary resources applies across industries However, the magnitude of the effect may be smaller than our findings from Study 1 An important phenomenon in the airline industry is the sales of frequent-flier miles to third-party vendors, such as retailers, so that consumers can earn frequent-flier miles with their retail purchases (Nunes and Drèze 2006) Because those vendors are more likely to want to associate with a larger airline to attract customers, the market share advantage found in Study 1 may have been further boosted by these partnership choices In an industry in which such partnerships do not exist, the market share advantage may be smaller Further research using data from multiple industries will help generalize the effects studied here and understand how they may interact with industry structures

Third, we examined the effects of loyalty programs without explicitly identifying the causes of some effects The increases in airline sales and consumer purchase frequencies we found here could be attributed to various reasons A classic explanation would be that the rewards motivated consumers to spend more because of the economic and psychological benefits we discussed previously Alternatively, the increase may also be due to more effective marketing as a result of consumer intelligence gained through loyalty programs Additional research is needed to examine how loyalty programs affect consumers' decision making as well as firms' business processes

Finally, the aforementioned partnerships between firms from different industries in their loyalty program initiatives have gained popularity in recent years In the airline industry, selling frequent-flier miles to such partners has even become a major revenue source for airlines (Ferguson and Hlavinka 2007) However, the effectiveness of this practice is still unestablished Although the expansion of point accumulation and redemption choices through such partnerships may increase the appeal of a loyalty program and bring immediate financial gains, there may be negative consequences in the long run, such as diversion from the main purpose of the program (i e , to increase consumer loyalty toward the focal firm) and contamination or dilution of brand images between the partnering firms These need to be evaluated in further research

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Wendy W. Moe & Sha Yang

Inertial Disruption: The Impact of a New Competitive Entrant on Online Consumer Search

The objective of this article is to examine the impact of a new competitive entry on online consumer search behavior The authors use store visitation as a measure of online search and decompose a shopper's tendency to search a given Web site into a baseline search preference for that site and an inertial effect of visiting that site They find that inertia is an important driver in search behavior and is easily disrupted by a new competitive entry This is a new and significant finding that contributes to the competitive entry literature The authors develop a Bayesian model of search that separates the role of baseline search preference and inertia on store visitation and captures the effect of a new competitive entry They apply this model to Internet clickstream data for the online bookstore market, in which they focus on the entry of Borders com in 1998

Keywords e-commerce, competitive entry, clickstream data, online search, hierarchical Bayesian models, consumer inertia

Consumer search has always been considered an important stage in the decision-making process and has been the focus of extant research in both online and offline environments (e g , Brynjolfsson and Smith 2000, Johnson et al 2004, Moorthy, Ratchford, and Talukdar 1997) Recently, research on consumer search has increasingly focused on the online environment (Brynjolfsson and Smith 2000, Johnson et al 2004, Lynch and Ariely 2000, Morwitz, Greenleaf, and Johnson 1998) With access to rich Internet clickstream data, researchers have been able to observe individual-level search behavior and to study more carefully any search dynamics that may exist For example, Johnson and colleagues (2004) model the nonstationarity found in online search behavior and show how the size of search sets changes as consumers gain experience In their article, they focus on the gradual changes in search patterns found in an evolving Internet environment In this article, we study how search is affected by a disruptive market change—namely, that of a new competitive entry Specifically, we examine shifts in consumer tendencies to search incumbent sites after the new competitor goes online

The context of our study is the online bookstore market pioneered by Amazon com in July 1995 Several competitors soon followed, including Barnesandnoble com in May 1997 In this article, we focus on the entry of Borders com, a notable new competitor that launched its site in May 1998 Before the Borders com launch, at least ten incumbent bookstores were established in the market The entry of Borders, a major competitor in the offline environment, marked a dramatic change in the online market and thus provides a rich context for us to study the effects of competitive entry on consumer search

Existing research on competitive entry has primarily focused on challenges facing the new entrant Far fewer studies have taken the perspective of the incumbent competitors Kalra, Rajiv, and Srinivasan (1998) examine incumbent response to new competitive entries However, the focus of their study is on the incumbent's time to respond to the new competitor rather than the effect of the new competitor on its customers and their behavior

A few studies have examined the impact of a new competitor on the behavior of existing customers In an experimental setting, Lehmann and Pan (1993) find that new competitors have the effect of shifting consideration sets toward dominating, compromise, and assimilated brands while steering them away from extreme brands Van Heerde, Mela, and Manchanda (2004) model the effect of product innovation on price elasticities of existing customers at the store level Finally, Mahajan, Sharma, and Buzzell (1993) provide a diffusion model approach to assess how a new entrant can affect potential market size for the category and incumbents

The objective of this article is to examine the impact of a new competitive entry on consumer search behavior We consider the consumer's store visitation decision of whether to visit specific store sites We develop a model that enables us to better understand the factors that drive a shopper's search behavior by decomposing search behavior into a baseline search preference and inertial effect (while considering dynamics over time and consumer heterogeneity) The model then captures and describes the change in behavior resulting from a new competitive entry We apply our model to Internet clickstream data for the online bookstore market, in which we focus on the entry of Borders com in 1998

The results of our proposed model provide new insights into online consumer search behavior and the impact of a

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new competitive entry Whereas Lehmann and Pan (1993) document the effect of a new competitive entry on preferences, we offer evidence that inertia plays an important role in online search and is easily disrupted by a new competitive entry This is a new and significant finding that contributes to the competitive entry literature We also test the effect of several behavioral covariates (observable from clickstream data) on postentry behavior and find that inertial behavior has a far greater influence on a person's response to a new competitive entrant than other measures of search behavior

Conceptual Framework

Online Search Behavior

In our study of online search behavior, we focus on store visitation Much of the existing research (in both the academic and the industry literature) has addressed this aspect of search (see Johnson et al 2004, Moe and Fader 2004, Summers 2007) Table 1 provides descriptive statistics pertaining to how a competitive entry affects store visitation The first column provides the percentage of sessions that include a visit to each given site The next two columns show the same metric for the preentry and postentry periods

With the entry of Borders com, Amazon com, the market leader, experienced a slight decrease in visitation, while Barnesandnoble com and Books com experienced increases This indicates that a competitive entry does not affect all incumbents equally, a pattern previously documented in context effects literature (Huber, Payne, and Puto 1982, Lehmann and Pan 1993)

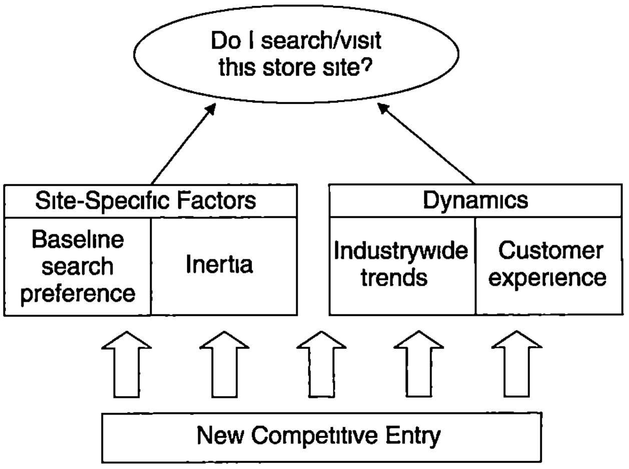
The purpose of this article is to investigate further the different ways a new competitive entry can affect customer online search behavior and thus affect the incumbents To this end, we discuss several factors that can potentially influence online search behavior and the potential effect of a new competitive entry on these factors Figure 1 presents an overview

Influence of Site-Specific Effects on Online Search

Various factors draw shoppers to visit a given store site For example, the store design, recommendation engines, customer reviews, and product assortment can all influence the customer's search experience at a site As a result, customers may have preferences for including specific store sites in their search set At the same time, some shoppers are simply creatures of habit and will search a given site simply because they searched that site the last time Previous studies have shown that such inertial effects exist and are separate from any preferences held by the consumer (Roy, Chintagunta, and Haldar 1996)

Therefore, in this article, we decompose a consumer's intention to search a site into a baseline search preference and an inertial effect Both baseline search preferences and inertial effects are specific to a given store site. The baseline search preference refers to the shopper's preference for searching a particular site (it indicates nothing about the shopper's preference to buy from that site), whereas the inertial effect represents habits That is, how much of a shopper's decision to search a given site is because the shopper searched the site the last time and is returning out of habit? Subsequently, we discuss how we model these separate constructs in greater detail

FIGURE 1
Overview of Factors Influencing Search



Influence of Dynamic Effects on Online Search

Although inertia can be considered a dynamic effect, we also consider additional dynamic effects that result from increased experience with online search either at the market level or at the individual customer level Two potential dynamic effects may exist First, there are industrywide trends that affect market-level behavior As the online retail

TABLE 1
Average Incidence Percentage by Site in the Calibration Sample

Site	Entire Data Period (N = 18,408)	Preentry Period (N = 6186)	Postentry Period (N = 12222)
Amazon com	839	845	836
Barnesandnoble com	131	112	141
Books com	032	027	035
Others	042	062	032
Borders com	027	N A	042

Notes N A = not applicable

market grows and matures, online search behavior may exhibit some predictable trends Overall search would be expected to increase as the online retail environment matures and the general population becomes more comfortable with computers, the Internet, and e-commerce Alternatively, as the market matures, a clear market leader may emerge, leading to increased search of larger sites and decreased search of smaller sites The true effect of industrywide dynamics is an empirical question that we address herein

Second, at the individual customer level, existing research has shown empirically that as a person gains search experience within a given online category, the breadth of search across store sites actually decreases (Johnson et al 2004) In other words, as consumers learn to search over time, they actually search less Therefore, in this article, we consider both industrywide and individual-specific sources of dynamics

Consumer Heterogeneity

Consumer heterogeneity plays an important role in our study Any approach we take in studying the impact of a new competitive entry must address the issue of consumer heterogeneity We do this by using a Bayesian modeling approach to accommodate unobserved heterogeneity in search preferences and inertial effects We also include a set of covariates to capture the effects of observed heterogeneity on search behavior, which we discuss in greater detail when we develop the model

The Effect of a Disruptive Market Event: Competitive Entry

A new competitive entry is a disruptive market event that can affect several, if not all, of the factors we mentioned previously Lehmann and Pan (1993) show that a new competitor can shift consumer preferences for incumbent sites toward the dominating brands and away from the extreme brands By extending their finding to the online retailing context, we would expect consumer search preferences to increase for the market leader and decrease for the smaller sites when a new competitor enters

Van Heerde, Mela, and Manchanda (2004) also study the effect of a disruptive market event Specifically, they examine the impact of a product innovation and show how consumer preferences around the time of the new product introduction are more variable In other words, a disruptive market event can induce consumers to reevaluate their preferences and behaviors In the online retailing context, this might mean that search preferences become more volatile One outcome of this may be that inertial effects are disrupted when consumers pause to reevaluate the market

Similar disruptive effects may also be observed in the dynamic effects The dynamic effects we discuss in this section reflect trends, regardless of whether they are industrywide or within-individual trends A disruptive market event, such as a new competitive entry, could easily change the course of these trends For example, we discussed that as consumers gain experience, they tend to search across fewer sites, partly because they have developed certain preferences and habits However, when a new competitor enters the market, the competitive landscape changes and forces consumers to question whether their preferences and habits in the preentry environment are still valid in the postentry environment

Data

We obtained the data used in this study from MediaMetrix, an Internet audience measurement service MediaMetrix monitors Web site usage for a panel of households that have agreed to have their clickstream behavior recorded For this study, we use only the clickstream data related to shopping behavior in the online bookstore category, as defined by MediaMetrix This resulted in a collection of ten Web sites at the start of our data period This set of Web sites is similar to those used by others who have conducted research in this category (e g , Johnson, Bellman, and Lohse 2003, Johnson et al 2004)

We focus on the 30-month period from July 1997 to December 1999 During this period, an 11th online bookstore, Borders com, was launched in May 1998[1] This event split the data into a 10-month preentry period and a 20-month postentry period Other significant launch dates include Barnesandnoble com, which was launched in May 1997, just before the start of our data set, and Amazon com, which was launched much earlier in July 1995

The raw data collected by MediaMetrix is at the click-by-click level That is, each URL a given household views is recorded along with a time stamp MediaMetrix aggregates this click-by-click data up to the session level for each individual household We further aggregate the data up to the daily level such that sessions initiated on the same day are considered one session, a procedure that Johnson and colleagues (2004) use This resulted in a data set consisting of 11,980 households that conducted a total of 53,082 sessions For each session, the sites visited are recorded in our final data set and used for the visitation model we present in the next section[2]

A limitation of using panel data for longitudinal studies is panel churn To control for churn (and to ensure model identification), we include in our final data set only households that shopped in the online bookstore category at least once before and at least once after Borders com entered This reduced our data set to 2389 households, accounting for 22,389 sessions In addition, there are several sites with low choice incidence[3] We pool these sites together for our analysis into an "Other" group Our final set of sites that we model consists of Amazon com, Barnesandnoble com, Books com, Other, and Borders com

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[1] The original launch date was set for January 1998, but the actual launch was delayed to allow for additional testing of the Web site (*Forbes* 1998)

[2] We also developed and estimated a model to examine the number of pages viewed at each site Because the results of this page-view model were similar to those of the visitation model, we focus only on the visitation model

[3] Store sites included in the "Other" category are Altbookstore com, Books-A-Million, Booksnow com, BookZone com, Powells com, Superlibrary, and Wordsworth com

Modeling Approach

The first step in our model development is to construct a model that captures a shopper's tendency to search a given Web site and to decompose that tendency into a baseline search preference, an inertial effect, and observed dynamics After constructing this underlying model, we can then introduce model components to capture consumer heterogeneity and any changes that result from a new competitive entrant

Conditional on a search session occurring, we model the search of each Web site as a multivariate binary incidence to account for consumers searching one or more than one Web site during each search session[4] We observe person i's decision of whether to search Web site j on session k and denote it as y_{ijk}, where $y_{ijk} = 1$ indicates a search and $y_{ijk} = 0$ indicates no search This observed decision, y_{ijk}, is determined by a latent search intention, y_{ijk}^{*}, where the superscript PRE stands for preentry observations and the superscript POST stands for postentry observations

(1a) $y_{ijk}^{PRE} = 1 \text{ if } y_{ijk}^{PRE*} > 0, \text{ and } y_{ijk}^{PRE} = 0 \text{ if } y_{ijk}^{PRE*} \le 0,$

(1b) $y_{ijk}^{POST} = 1 \text{ if } y_{ijk}^{POST*} > 0, \text{ and } y_{ijk}^{POST} = 0 \text{ if } y_{ijk}^{POST*} \le 0$

In each period, the latent search intention for a given site is driven by the consumer's underlying search preference for that site, an inertial effect, and observed dynamics In each period, this can be represented as follows

(2a) Preentry period $y_{ijk}^{PRE*} = \theta_{ijk}^{PRE}X_{ijk}^{PRE} + \beta_{j1}^{PRE}\text{Time}_{ik} + \beta_{j2}^{PRE}\text{Session}_{ik} + \varepsilon_{ijk}^{PRE}$, and

(2b) Postentry period $y_{ijk}^{POST*} = \theta_{ijk}^{POST}X_{ijk}^{POST} + \beta_{j1}^{POST}\text{Time}_{ik} + \beta_{j2}^{POST}\text{Session}_{ik} + \varepsilon_{ijk}^{POST}$,

where X_{ijk} includes a site-specific intercept representing the baseline search preference and a lag term, $y_{ij,k-1}$, representing the inertial effect Time_{ik} and Session_{ik} capture observed dynamics The Time_{ik} covariate indicates the day on which the search k takes place (for the first search session observed in our data set, Time = 1) and can capture industrywide dynamics The Session_{ik} covariate measures the number of sessions in which the consumer searched for books before the given search k and captures individual-specific dynamics that result from increased experience Note that Session_{ik} is individual specific, not site specific, and counts the number of bookstore searches conducted by person i regardless of the sites searched In the preentry period, we model each of j = 1, 2, , J – 1 incumbent sites In the postentry period, we model j = 1, 2, , J sites, where the Jth site is the new competitive entrant

We specify the error terms as follows

(3a) $\varepsilon_{ijk}^{PRE} \sim MVN(0, R^{PRE})$, and

(3b) $\varepsilon_{ijk}^{POST} \sim MVN(0, R^{POST})$,

where R^{PRE} is fixed to be a 4 × 4 correlation matrix and R^{POST} is fixed to be a 5 × 5 correlation matrix, as in a standard multivariate binary probit model

We also allow for heterogeneity in the preentry period as follows

(4) $$\theta_i^{PRE} = \overline{\theta^{PRE}} + \eta_i^{PRE},$$

where θ_i^{PRE} is a 2(J – 1) × 1 vector indicating person i's preferences and inertial effects for the J – 1 sites before the competitive entry and θ^{PRE} is the average baseline search preferences and inertial effects for the J – 1 sites before the competitive entry

After the new competitor enters the market, baseline search preferences and inertial effects are expected to shift To capture this shift, we model the baseline search preferences and inertial effects in the postentry period as follows

(5) $$\theta_i^{POST} = \alpha_j'S_i + \Gamma\theta_i^{PRE} + \eta_i^{POST},$$

where θ_i^{POST} is a 2J × 1 vector indicating baseline search preferences and inertial effects for the J sites after the competitive entry, S_i is a vector of observed individual-specific covariates (including a constant), and Γ is a 2J × 2(J – 1) transition matrix to be estimated

To elaborate further, the Γ transition matrix represents the influence of preentry parameters on postentry preferences and inertial effects For example, the first row of the Γ matrix measures the influences of baseline search preferences and inertial effects for the J – 1 sites before entry on the baseline search preference for site 1 after entry The J + 1th row of the Γ matrix measures the influences of baseline search preferences and inertial effects for J – 1 sites before entry on the inertial effect for site 1 after entry

We include the individual-specific covariates (S_i) to control for any observed heterogeneity in individual search patterns Rather than using demographic characteristics of individual visitors, which are typically unavailable from clickstream data, we develop a set of behavioral covariates derived from each person's historical behavior in the preentry period The first set of covariates characterizes people as one of three search types (1) nonsearchers, (2) variety searchers, and (3) within-session searchers[5] Nonsearchers are people who limit their search set to just one site In addition, they visit the same site session after session Variety searchers also limit their search set to just one site However, unlike the nonsearchers, they vary the site from session to session Finally, within-session searchers are people who visit multiple sites within the same search session We include only the indicators for variety searchers and within-session searchers in S_i for identification purposes In addition, the search type effect appears only in the postentry period Because search type is measured using preentry data, we cannot include it as a covariate in the preentry model Instead, we capture any individual differences that may be associated with search type in the preentry period as unobserved heterogeneity. The second set of covariates includes measures of recency and frequency. We define recency as the number of days between the last preentry visit and the date of competitive entry. We measure frequency as the number of visits made in the preentry period. We realize that this is a left-censored measure, but it serves as a proxy given our data constraints.

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[4] We consider each visit to a given Web site a search of that site

[5] The ability of these measures to accurately reflect a person's search type is dependent on the amount of individual search history contained in the data This may be limited

To complete the specification of θ_{ijk}, η_i^{PRE} and η_i^{POST} are random components for preentry and postentry search preferences, which are assumed to be independent across people and normally distributed:

$$\text{(6a)} \qquad \eta_i^{PRE} \sim MVN(0, \Sigma^{PRE}), \text{ and}$$

$$\text{(6b)} \qquad \eta_i^{POST} \sim MVN(0, \Sigma^{POST}),$$

where the Σ^{PRE} and Σ^{POST} matrices represent heterogeneity across people and are diagonal. This concludes our specification of the visitation model.

The likelihood specified is complex because it involves higher-order multidimensional integrals, which make the classical inference difficult. We use the Bayesian framework to make inferences about the unknown parameters. Specifically, we use a combination of the Gibbs sampler, the Metropolis–Hastings random walk algorithm, and data augmentation to obtain a sample of parameter draws from their joint posterior distribution (see the Appendix). Another advantage of the Bayesian estimation approach is that the estimates of individual consumer baseline search preferences and inertial effects are a by-product from the Markov chain Monte Carlo algorithm but are treated as nuisance parameters and integrated out under the classical inference approach. These individual-level estimates are valuable in helping understand heterogeneous consumer search patterns, which we demonstrate subsequently in this article.

Results

Preentry Parameter Estimates

We begin by discussing the individual parameter estimates resulting from the visitation model. Subsequently, we integrate the individual elements of the model and discuss the overall implications for incumbent competitors facing a new competitive entry. Table 2 presents all parameter estimates associated with the preentry period.

The first two columns (θ^{PRE}) decompose the latent search intention toward a given site into a baseline search preference and an inertial effect. The next two columns provide the dynamic effects, and the final two columns (Σ^{PRE}) represent the degree of variance, or heterogeneity, found in these measures across shoppers. The state dependence parameters provided in Column 2 are significant and positive, suggesting behavioral inertia. These results indicate that the role of inertial effects in a shopper's overall intention to search a given site is important, highlighting the value of separating baseline search preferences from inertial effects.

Although these inertial parameters are significantly and substantially different from zero, we caution the reader against interpreting the absolute magnitude of the estimated parameters because of the highly nonlinear nature of the multivariate probit model. Instead, we focus on measures of sensitivity that assess the influence of lag search on current search probability. Specifically, we measure sensitivity as the percentage change of predicted search probability on a given Web site from the case without a lag search incidence to the case with a lag search incidence on the same site. Table 3 reports the lag search sensitivity in the preentry period for each site and indicates that the smaller sites (6.156 for Books.com and 2.198 for Others) are more affected by inertia than the larger sites (.114 for Amazon.com and 1.491 for Barnesandnoble.com). We discuss these results further when we compare preentry behavior with postentry behavior.

The model also reveals significant dynamics in consumer search behavior. The dynamics captured by the Time covariate indicate general trends in the online bookstore market. As time passes, consumers increasingly include Amazon.com in their search sets ($\beta_{AM,1}^{PRE}$ = .122), while the presence of Barnesandnoble.com in search sets decreases ($\beta_{BN,1}^{PRE}$ = –.226). This trend may reflect increased branding efforts on the part of Amazon.com. The dynamics with respect to Barnesandnoble.com can be better understood by also examining the Session covariate.

The coefficients for the Session covariate are negative for Barnesandnoble.com ($\beta_{BN,2}^{PRE}$ = –.179) and Books.com

TABLE 2
Preentry Results

	θ^{PRE}		Dynamics		Σ^{PRE}	
	Baseline Preference	**Inertial Effect**	**Time**	**Session Count**	**Baseline Preference**	**Inertial Effect**
Amazon.com	**.939**	**.469**	**.122**	–.076	**.288**	**.225**
	(.039)	**(.051)**	**(.033)**	(.045)	**(.041)**	**(.041)**
Barnesandnoble.com	**–1.455**	**.545**	**–.226**	**–.179**	**.224**	**.384**
	(.038)	**(.096)**	**(.035)**	**(.054)**	**(.043)**	**(.099)**
Books.com	**–2.352**	**.852**	–.043	**–.132**	**.360**	**.386**
	(.056)	**(.144)**	(.054)	**(.062)**	**(.059)**	**(.112)**
Other	**–2.047**	**.533**	–.033	.053	**.519**	**.392**
	(.077)	**(.144)**	(.051)	(.058)	**(.101)**	**(.125)**

Notes: Elements in bold are significant at p = .10.

TABLE 3
Preentry Inertial Effect Measured by the Lag Search Sensitivity'

Amazon com	114
Barnesandnoble com	1 491
Books com	6 156
Other	2 198

Notes Lag search sensitivity = [P(lag_search = 1) – P(lag_search = 0)]/P(lag_search = 0)

($\beta^{PRE}_{BK,2}$ = – 132) and insignificant for Amazon com and Other sites The overall negative effect of Session is consistent with the existing literature on online search, which reports that as consumers gain experience searching in a given category, they tend to include fewer store sites in their search set The negative Session coefficients for Barnesandnoble com and Books com indicate that as consumers gain experience in this category, they become less likely to search these two sites This implies that the shopping experiences at these sites may not fare as well as their competitors, and as a result, these sites are suffering the consequences of shrinking search sets

The Transition Matrix

When a market disruption (e g , new competitive entry) occurs, baseline search preferences and inertial effects shift as a function of the transition matrix according to Equation 5 Table 4 presents all estimated elements of the transition matrix, Γ To simplify our discussion of the results, we focus on two quadrants (1) the impact of preentry search preferences on postentry search preferences (upper-left-hand quadrant) and (2) the impact of preentry inertial effects on postentry inertial effects (lower-right-hand quadrant) The other two quadrants effectively serve as control variables and are not the focus of our study

The diagonal elements of the matrix indicate the influence of the preentry value on the postentry value for a given measure For example, in the upper-left-hand quadrant of the matrix, the baseline search preferences for Amazon com in the postentry period are independent of the baseline search preferences in the preentry period because the value of Γ_{11} is insignificantly different from zero However, the postentry baseline search preferences for Amazon com's competitors are greater if preentry values are higher, as indicated by the positive values for these sites along the diagonal This suggests some degree of preference reinforcement for these sites when the new competitor enters

The off-diagonal elements suggest a negative influence of preentry search preference for the market followers on postentry preference for the market leader, Amazon com For example, shoppers who prefer to search Barnesandnoble com and/or Books com are likely to have lower search preferences for Amazon com in the postentry period (Γ_{12} = – 338, Γ_{13} = – 382) Other off-diagonal values among the incumbent competitors are insignificantly different from zero This suggests that if a shopper holds a strong preference for searching one of the existing market followers, he or she is less likely to shift search preferences toward another incumbent site in the postentry period

TABLE 4
Transition Matrix (Γ)

	Preentry Baseline Search Preference				Preentry Inertial Effect			
	AM	BN	BK	OT	AM	BN	BK	OT
Postentry Baseline Search Preferences								
Amazon com (AM)	– 194	**–.338**	**–.382**	– 200	**1.287**	**–.435**	**–.863**	**–.751**
	(160)	**(.111)**	**(.181)**	(268)	**(.219)**	**(129)**	**(.249)**	**(.140)**
Barnesandnoble com (BN)	– 035	**656**	– 108	126	**–.700**	158	**.847**	147
	(154)	**(200)**	(154)	(123)	**(.259)**	(132)	**(.092)**	(185)
Books com (BK)	031	– 571	**.852**	178	– 485	**.898**	**.714**	– 338
	(288)	(310)	**(.239)**	(325)	(398)	**(.365)**	**(.238)**	(251)
Other (OT)	– 181	253	105	**.550**	**–.711**	**414**	248	– 351
	(206)	(184)	(185)	**(.142)**	**(.309)**	**(.192)**	(180)	(289)
Borders com	080	174	**.365**	235	**–.780**	001	**.416**	– 253
	(189)	(189)	**(.144)**	(137)	**(.253)**	(213)	**(.160)**	(222)
Postentry Inertial Effects								
Amazon com (AM)	**.316**	**–.292**	242	– 081	**.553**	210	– 006	**.787**
	(.156)	**(.133)**	(147)	(182)	**(.247)**	(158)	(245)	**(.191)**
Barnesandnoble com (BN)	246	– 079	**.399**	124	– 820	331	160	**.813**
	(194)	(175)	**(.173)**	(184)	(256)	(214)	(246)	**(.182)**
Books com (BK)	485	621	**1.363**	002	– 668	007	**.647**	396
	(626)	(540)	**(.461)**	(380)	(1 141)	(511)	**(.293)**	(898)
Other (OT)	749	– 439	530	– 269	– 465	– 530	– 605	**845**
	(534)	(480)	(401)	(238)	(495)	(426)	(544)	**(.334)**
Borders com	430	– 272	299	– 205	**–.871**	578	**.466**	**.965**
	(348)	(368)	(199)	(260)	**(.284)**	(367)	**(.292)**	**(.253)**

Notes The values represent posterior means Posterior standard deviations appear in parentheses Elements in bold are significant at $p <$ 05

The lower-right-hand quadrant of the matrix represents the influence of preentry inertial effects on postentry inertial effects. For Amazon.com and Books.com, the positive estimates indicate that the competitive entry reinforces any preentry inertial effects they experience (Γ_{65} = .553, Γ_{87} = .647). Several off-diagonal elements in this quadrant are significantly positive, indicating that higher inertial effects for a given site in the preentry period may enhance postentry inertial effects. However, these parameter estimates should not be interpreted in isolation. Because of the negative intercept terms associated with postentry inertia (see Table 5), the net result is actually a decline in inertial effects in the postentry period. The positive elements in the transition matrix only serve to mitigate that decline. Subsequently in this section, we integrate the various parameter estimates and discuss the overall impact of the competitive entry on search behavior.

From the perspective of the new entrant, Borders.com draws customers from those who prefer to search Books.com (Γ_{53} = .365). The customers attracted from Books.com are also highly inertial (Γ_{57} = .416). Conversely, Amazon.com customers with high levels of preentry inertia for Amazon.com are less likely to prefer Borders.com (Γ_{55} = –.780).

Postentry Parameters

The transition matrix is not the only model component that drives postentry behavior. Table 5 presents the remaining parameter estimates that affect postentry search behavior. The only significant direct effects of search type on postentry behavior are evident in the baseline search preferences for Books.com and Others. People who have historically been variety searchers in the preentry period are more likely to include Books.com in their postentry search sets. Those who have historically been within-session searchers are more likely to include the Other sites in their postentry search sets. Although these are noteworthy results, they are not our focus here. Likewise, recency and frequency measures also have mixed effects. Most coefficients are insignificant, and those that are significant do not exhibit consistent or predictable patterns. As a result, we treat these estimates as merely control measures to accommodate observed customer heterogeneity and not any sort of predictive variable.

The dynamic effects in the postentry period are more insightful, especially compared with the preentry dynamic effects. In the postentry period, Time dynamics provide a positive effect on postentry search intentions for Barnesandnoble.com and negative effects on all other incumbents. In other words, in the postentry period, industrywide trends are favorable for Barnesandnoble.com. This is in contrast to the negative effect of Time on Barnesandnoble.com and the positive effect of Time on Amazon.com in the preentry period. The transition matrix already indicated that Barnesandnoble.com benefits from a one-time, sudden effect on search intentions after the launch of Borders.com. In addition, the Time coefficient suggests that the launch of Borders.com leads to a positive trend in search intentions for Barnesandnoble.com as well ($\beta^{POST}_{BN,1}$ = .511). Together, these results suggest that the entry of Borders.com is an event that increases the appeal of Barnesandnoble.com. Although the effect of Session on Barnesandnoble.com is negative ($\beta^{POST}_{BN,2}$ = –.099), it is outweighed by the effect of Time.

Again, the negative coefficient for Session in the postentry period for Barnesandnoble.com ($\beta^{POST}_{BN,2}$ = –.099) is consistent with the existing online search literature and the preentry results. However, Amazon.com benefits from a positive Session coefficient ($\beta^{POST}_{AM,2}$ = .053). The implication here is that as Internet shoppers gain experience with online book shopping, they are increasingly including Amazon.com in their search sets. Thus, while Barnesandnoble.com benefits from Time dynamics, Amazon.com benefits from Session dynamics in the postentry period.

Table 6 provides estimates for the correlation matrices specified in Equations 3a and 3b. The matrices indicate statistically significant correlations across sites. Specifically, the decision to visit Amazon.com is negatively correlated with the decision to visit its competitors. This is true for both the preentry and the postentry periods and justifies our use of a multivariate binary probit analysis instead of treating the search decision as independent across sites.

Overall Results

Thus far, we have discussed the results of each element of the model one by one. Although it is important to understand how to interpret individual model parameters, it may be more useful to examine the overall change in search behavior from the preentry to the postentry period, especially as it relates to inertial effects. To facilitate this comparison, we calculate the lag search sensitivity for each Web site in the postentry period and then compare the resultant preentry and postentry lag search sensitivity in Table 7. These sensitivities represent the sensitivity of search probabilities to the lag search, which is another way to measure the impact of inertial effect. We stress that these parameter estimates should be converted into sensitivities to facilitate the pre- and postentry comparison. This is because the covariance matrix of the error terms in the multivariate probit model is scaled to be a correlation matrix for identification, and therefore other model parameters are estimated relative to this scale.

Across all sites, the inertial effects decrease significantly after the new competitor enters the market. This suggests that such a market disruption can significantly affect search behavior by disrupting established habits. In other words, visitors who have been habitually shopping at an incumbent Web site are more at risk of defecting after a new competitor enters the market than visitors who have not exhibited such inertial behavior. It could be argued that the decrease in inertial effects in the postentry period can simply be a result of regression to the mean. In other words, high levels of inertia in the preentry period may simply be reverting to a lower mean, resulting in a decrease in inertial effects in the postentry period. However, if regression to the mean were driving the results, the reverse (or increasing inertial effects) would also be true for sites experiencing low levels of inertia in the preentry period. Because the results in Table 7 show that inertial effects decrease across all sites, we are confident that some level of inertial decay is

TABLE 5
Postentry Results

	Intercept	Within-Session Searchers	Variety Searchers	Recency	Frequency	ΣPOST
Postentry Baseline Search Preferences						
Amazon com	**.490**	131	**.228**	**.101**	013	**.115**
	(.156)	(216)	**(.115)**	**(.052)**	(052)	**(.014)**
Barnesandnoble com	**–1.316**	– 236	– 089	– 001	047	**.134**
	(.190)	(138)	(095)	(030)	(038)	**(018)**
Books com	**–3.100**	095	282	053	010	**.702**
	(.466)	(302)	(244)	(086)	(071)	**(.163)**
Other	**–.795**	– 117	– 164	**–.158**	**.086**	**.505**
	(.279)	(203)	(169)	**(.066)**	**(.040)**	**(.097)**
Borders com	**–.812**	– 101	– 111	051	**084**	**.450**
	(.343)	(148)	(129)	(044)	**(.036)**	**(.083)**
Postentry Inertial Effects						
Amazon com	**–.624**	197	– 035	– 124	– 059	**.122**
	(.180)	(202)	(109)	(056)	(045)	**(.016)**
Barnesandnoble com	341	062	– 298	– 065	– 036	**.279**
	(449)	(283)	(170)	(063)	(053)	**(.053)**
Books com	**2.071**	– 299	**–1 106**	**–.504**	114	**1.146**
	(1.027)	(731)	**(.484)**	**(238)**	(147)	**(432)**
Other	124	670	077	– 025	– 045	**.732**
	(281)	(517)	(380)	(264)	(083)	**(.269)**
Borders com	**–1.518**	090	185	– 163	– 041	**.477**
	(.264)	(388)	(382)	(148)	(097)	**(.146)**

	Time	Session Count
Postentry y*		
Amazon com	**–.281**	**.053**
	(.014)	**(.012)**
Barnesandnoble com	**.511**	**–.099**
	(.017)	**(.019)**
Books com	**–.189**	– 023
	(.035)	(024)
Other	– 040	008
	(023)	(023)
Borders com	**.041**	**–.058**
	(.019)	**(.024)**

Notes The values represent posterior means Posterior standard deviations appear in parentheses Elements in bold are significant at $p <$ 05

TABLE 6
Correlation Matrices

Preentry	Amazon.com	Barnesandnoble.com	Books.com	Other	Borders.com
Amazon com	1	**–.182 (.018)**	**–.040 (.017)**	**–.085 (.018)**	
Barnesandnoble com		1	– 008 (017)	– 012 (018)	
Books com			1	001 (019)	
Other				1	

Postentry	Amazon.com	Barnesandnoble.com	Books.com	Other	Borders com
Amazon com	1	**–.162 (.016)**	– 020 (014)	**–.043 (017)**	**–.056 (.015)**
Barnesandnoble com		1	001 (016)	– 001 (016)	– 004 (016)
Books com			1	005 (014)	006 (015)
Other				1	002 (015)
Borders com					1

Notes The values represent posterior means Posterior standard deviations appear in parentheses Elements in bold are significant at $p <$ 05

TABLE 7
Comparison Between Preentry and Postentry Inertial Effect Measured by the Lag Search Sensitivity

	Preentry Inertial Effect	Postentry Inertial Effect
Amazon com	114	018
Barnesandnoble com	1 491	400
Books com	6 156	– 996
Other	2 198	1 184

Notes Lag search sensitivity = [P(lag_search = 1) – P(lag_search = 0)]/P(lag_search = 0) Inertial effects are statistically significant across all sites

occurring beyond any potential effects resulting from a regression to the mean In addition, we observe varying degrees of inertial decay across sites The decay experienced by the market leaders (Amazon com and Barnesandnoble com) is less than that experienced by the market follower (Books com), a result consistent with the context effect research we discussed previously (Huber, Payne, and Puto 1982, Lehmann and Payne 1993)

The inertial disruption of a competitive entry is a key finding of our model and emphasizes the importance of decomposing customer search behaviors into underlying baseline search preferences and inertial effects In industries in which this effect holds true, customer bases dominated by people whose search behaviors are strongly influenced by inertia are more at risk in the face of a competitive entry Incumbent competitors with such customer bases should proactively attempt to identify and target people with large inertial effects in anticipation of a new competitor entering the market

Model Validation and Simulation

Because a key element of this research is the identification of highly inertial people as likely defectors, it is important that the proposed model can accurately decompose a person's behavior into a baseline search preference and inertial effect and link them to the same person's postentry behavior We test the model's ability to do this by examining hit rates in a validation sample We also compare the predictive performance of the proposed model with two benchmark models

We begin by estimating the model on a calibration sample of 18,408 observations (y_{ijk}^{IN}) based on 2028 people We saved the remaining 3981 observations (y_{ijk}^{OUT}) from the postentry period based on 361 people for the out-of-sample prediction purposes For this validation sample, we use their preentry data along with the estimation results from the calibration sample to obtain postentry parameters We then predict the postentry search behavior of the holdout sample

The first benchmark model (Model 1) completely ignores the structural change induced by the new competitor's entry In this validation, we first estimate θ_{ij}^{PRE} ($j = 1$, 2, 3, and 4) and the other model parameters with the preentry data from the 361 people and let $\theta_{ij}^{POST} = \theta_{ij}^{PRE}$ for incumbent Web sites For the new entrant, we estimate θ_{ij}^{POST} ($j = 5$) and the other model parameters with a standard binary probit model estimated on the postentry data in the calibration sample without accounting for any structural change induced by the competitive entry We then use θ_{ij}^{POST} and the other model parameters to predict the postentry search behavior for the holdout sample

The second benchmark model (Model 2) completely ignores the search history before the competitive entry for the 361 people in the holdout sample Instead, we estimate the aggregate-level model parameters with a standard multivariate probit model using the calibration sample and use these parameters to predict the postentry search behavior on the five Web sites for the holdout sample

Table 8 presents the results of our validation test Our analysis shows that the proposed model can accurately predict the search incidence of the five Web sites for 3772 of the 3981 observations, for a 94 8% hit rate This impressive level of predictive accuracy validates the use of the model for the identification of specific people to target

The performance of the proposed model is also significantly better than that of the benchmarks Model 1 ignores

TABLE 8
Model Validation

(N = 3981)	Number of Observations Accurately Predicted	Hit Rate
Proposed model	3774	94.8%
Model 1	3567	89.6%
Model 2	3485	87.5%

the structural change due to the competitor's entry and provides accurate predictions for 3563 observations, for an 89.6% hit rate. Model 2 ignores the preentry search history and provides accurate predictions for 3482 observations, for an 87.5% hit rate. This suggests the importance of accounting for both the search behavior before the competitor's entry (θ_{ij}^{PRE}) and the structural change induced by the competitor's entry (Γ) in predicting a consumer's postentry search behavior.

To demonstrate the predictive ability of the model, we simulate postentry visitation behavior on the basis of several preentry behavioral scenarios. For each store site, we simulate the behavior for an existing customer (i.e., $y_{ij,k-1}$) with low inertial effects, mean inertial effects, and high inertial effects in the preentry period. We assume mean values for all other parameters so that the only source of variability between simulated customers is the level of the preentry inertia effect. Using these simulated preentry profiles, we then simulate both pre- and postentry visitation behavior. For the mean shopper, we simply use the $\overline{\theta^{PRE}}$ estimates provided in Table 2 to generate preentry visitation probabilities, postentry parameter estimates, and postentry visitation probabilities. For customers with low inertial effects, we construct a scenario in which the baseline search preference is unchanged but the inertial effect in $\overline{\theta^{PRE}}$ is one standard error below the mean. For customer with high inertial effects, we calculate inertial effects to be one standard error above the mean.

Table 9 provides the difference in pre- and postentry visit probabilities for each customer type at each store site. Across sites and customer types, there is a decline in visit probabilities in the postentry period, an expected outcome when a new competitor enters the market. However, the magnitude of decline varies systematically across customer types. Regardless of the store site, customers with high inertial effects in the preentry period experience a greater decline in visit probabilities in the postentry period. This supports our argument that, all else being equal, highly inertial customers are more vulnerable in the face of a new competitive entry.

Conclusion

In this article, we proposed a model of search behavior in an effort to examine the impact of a new competitor entering the market. In our model, we decompose a person's search intention for a given Web site into a baseline search preference for that site and an inertial effect representing habit, while accommodating dynamics. We then model the impact of a new competitive entry on each of these search drivers. Our objective with the modeling effort was to better understand how the new competitor changed not only overall search behaviors but also site-specific search preferences and inertial effects for the incumbent sites.

A unique aspect of our model is the identification of inertial effects in search behavior. The results show that this inertial effect is substantial. They also show that this effect is vulnerable to a market disruption, such as a new competitive entry. For incumbents in industries with dynamics similar to the one we present herein, the identification of highly inertial customers may serve as a first step to limiting the negative effect of an anticipated competitive entry. However, determining whether or what tools are available to stem the potential attrition of these customers is left for further research. We also encourage additional research on the role of inertia in other market environments. We show that inertia is highly vulnerable to a new competitive entry in the online bookstore market. If this result can be shown to generalize across markets, future marketers facing a potential new competitor can better prepare for (and potentially defend against) the impending market disruption.

It is worth mentioning some limitations of the proposed model and its application. Although our model examines the consumer response to a competitive entry, it does not address the competitor's decision to enter. We would expect such entry decisions to be dependent on the expected consumer response to the entry. A new competitor would enter the market only if it anticipated some level of success in either attracting new customers into the market or stealing

TABLE 9
Simulation Results: $Pr(y^{POST}) - Pr(y^{PRE})$

		Amazon.com	Barnesandnoble.com	Books.com	Other
Nonsearcher	Low inertia	–.79%	–13.48%	–3.93%	–3.48%
	Mean inertia	–.99%	–15.58%	–5.62%	–4.89%
	High inertia	–1.16%	–17.85%	–7.85%	–6.70%
Within-session searcher	Low inertia	–2.28%	–11.75%	–3.93%	–2.05%
	Mean inertia	–2.40%	–13.78%	–5.62%	–3.09%
	High inertia	–2.50%	–16.00%	–7.85%	–4.47%
Variety searcher	Low inertia	–4.05%	–13.09%	–3.93%	–3.27%
	Mean inertia	–4.10%	–15.16%	–5.63%	–4.61%
	High inertia	–4.12%	–17.42%	–7.85%	–6.35%

customers away from the existing competitors. As such, overall consumer search probability and the competitive entry decision are potentially endogeneous. However, because of data limitations, we are not able to model the impact of the competitive entrant and the entry decision simultaneously. In addition, our primary contributions are the decomposition of overall search probabilities into a baseline preference and inertial effects and the finding that inertial effects are disrupted by a new competitive entry. The potential problems that may arise from endogeneity in our study are not likely to be substantial. At the time of the Borders.com entry into the online bookstore market, the Internet was still a rapidly growing environment. Companies raced to enter, often without much thought about strategy or even profitability. This is evident in Borders.com's decision and the delays it experienced in launching the site as it was working out technical difficulties.

Another limitation is a consequence of the nature of the data used in this study. To estimate our model, we use data collected from a panel of volunteers who had all their online behavior recorded. This provides us with search behavior across all sites in this product category. However, Web sites do not have access to this kind of data for their entire customer base. Without knowledge of how customers search across sites, the applicability of the proposed model and its findings is limited. A potential remedy of this problem is to survey customers about their historical search behaviors. A well-designed survey that solicits a characterization of respondents' search patterns could assist in the identification of inertial shoppers.

This research focuses on the effect of a new competitive entry on incumbent competitors and their customers. However, our approach can be applied to other market disruptions as well, such as product modifications, the merging of competitors, or regulatory changes. In addition, a variety of product categories can be studied to identify market characteristics that drive the nature of the effect. Finally, our model can be extended to study the impact of competitive entry on cross–state dependence effects. Overall, the impact of a new competitive entry on the existing customer base is an issue that has tremendous potential but, in general, has been understudied. We hope that this article will stimulate further research in this direction.

Appendix: The Markov Chain Monte Carlo Algorithm

1. Generate y_{ijk}^{PRE*}

$$y_{ijk}^{PRE*} = \overline{y_{ijk}^{PRE*}} + \varepsilon_{ijk}^{PRE},\ \overline{y_{ijk}^{PRE*}} = \theta_{ijk}^{PRE}X_{ijk}^{PRE}$$
$$+ \beta_{j1}^{PRE}\text{Time}_{ik} + \beta_{j2}^{PRE}\text{Session}_{ik}$$

- If $y_{ijk}^{PRE} = 1$, draw $y_{ijk}^{PRE*} \sim N(\overline{y_{ijk}^{PRE*}} + E_{ijk}, V_{ijk})$, such that $y_{ijk}^{PRE*} > 0$, and
- If $y_{ijk}^{PRE} = 0$, draw $y_{ijk}^{PRE*} \sim N(\overline{y_{ijk}^{PRE*}} + E_{ijk}, V_{ijk})$, such that $y_{ijk}^{PRE*} < 0$,

where E_{ijk} (V_{ijk}) is the conditional mean (variance) of ε_{ijk}^{PRE}, conditioning on $\varepsilon_{ij'k}^{PRE}$ and $j' \neq j$

2. Generate y_{ijk}^{POST*}

$$y_{ijk}^{POST*} = \overline{y_{ijk}^{POST*}} + \varepsilon_{ijk}^{POST},\ \overline{y_{ijk}^{POST*}} = \theta_{ijk}^{POST}X_{ijk}^{POST}$$
$$+ \beta_{j1}^{POST}\text{Time}_{ik} + \beta_{j2}^{POST}\text{Session}_{ik}$$

- If $y_{ijk}^{POST} = 1$, draw $y_{ijk}^{POST*} \sim N(\overline{y_{ijk}^{POST*}} + E_{ijk}, V_{ijk})$, such that $y_{ijk}^{POST*} > 0$, and
- If $y_{ijk}^{POST} = 0$, draw $y_{ijk}^{POST*} \sim N(\overline{y_{ijk}^{POST*}} + E_{ijk}, V_{ijk})$, such that $y_{ijk}^{POST*} < 0$,

where E_{ijk} (V_{ijk}) is the conditional mean (variance) of ε_{ijk}^{POST}, conditioning on $\varepsilon_{ij'k}^{POST}$ and $j' \neq j$

3. Generate θ_i^{PRE}

$$\overline{y_{ijk}^{PRE*}} = y_{ijk}^{PRE*} - \beta_{j1}^{PRE}\text{Time}_{ik} - \beta_{j2}^{PRE}\text{Session}_{ik}$$
$$= \theta_{ijk}^{PRE}X_{ijk}^{PRE} + \varepsilon_{ijk}^{PRE},$$
$$\theta_i^{POST} = \alpha S_i + \Gamma\theta_i^{PRE} + \eta_i^{POST}, \text{ and}$$
$$\theta_i^{PRE} = \overline{\theta^{PRE}} + \eta_i^{PRE}$$

Then, generate

$$\theta_i^{PRE} \sim MVN(W_i, P_i),$$

where

$$P_i = \{(\Sigma^{PRE})^{-1} + [X_i^{PRE}(R^{PRE})X_i^{PRE\prime}]$$
$$+ [\Gamma'(\Sigma^{POST})^{-1}\Gamma]\}^{-1} \text{ and}$$
$$W_i = P_i[(\Sigma^{PRE})^{-1}\overline{\theta_i^{PRE}} + X_i^{PRE}(R^{PRE})^{-1}\overline{y_i^{PRE*}}$$
$$+ \Gamma'(\Sigma^{POST})^{-1}(\theta_i^{POST} - \alpha S_i)]$$

4. Generate θ_i^{POST}

$$\overline{y_{ijk}^{POST*}} = y_{ijk}^{POST*} - \beta_1^{POST}\text{Time}_{ik} - \beta_2^{POST}\text{Session}_{ik}$$
$$= \theta_{ijk}^{POST}X_{ijk}^{POST} + \varepsilon_{ijk}^{POST}, \text{ and}$$
$$\theta_i^{POST} = \alpha S_i + \Gamma\theta_i^{PRE} + \eta_i^{POST}$$

Then, generate

$$\theta_i^{POST} \sim MVN(W_i, P_i),$$

where

$$P_i = \{(\Sigma^{POST})^{-1} + [X_i^{POST}(R^{POST})^{-1}X_i^{POST}]\}^{-1} \text{ and}$$
$$W_i = P_i[(\Sigma^{POST})^{-1}(\alpha S_i + \Gamma\theta_i^{PRE}) + X_i^{POST}(R^{POST})^{-1}\overline{y_i^{POST}}]$$

5. Generate β^{PRE}

$$\overline{y_{ijk}^{PRE*}} = y_{ijk}^{PRE*} - \theta_{ijk}^{PRE}X_{ijk}^{PRE} = \beta_j^{PRE}z_{ik} + \varepsilon_{ijk}^{PRE}$$

The prior of $\beta_j^{PRE} \sim MVN(0, 100I)$. Then, generate

$$\beta_j^{PRE} \sim MVN(A_j, B_j),$$

where

$$B_j = [z'z/V_j + 01I]^{-1} \text{ and}$$

$$A_j = B_j[z'(\overline{y^{PRE*}} - E_j)/V_j],$$

where E_{ijk} (V_j) is the conditional mean (variance) of ε_{ijk}^{PRE}, conditioning on $\varepsilon_{ij'k}^{PRE}$ and $j' \neq j$

6. Generate β^{POST}

$$\overline{y_{ijk}^{POST*}} = y_{ijk}^{POST*} - \theta_{ijk}^{POST}X_{ijk}^{POST} = \beta_j^{POST}z_{ik} + \varepsilon_{ijk}^{POST},$$

where $\beta_j^{POST} \sim MVN(0, 100I)$ Then, generate

$$\beta_j^{POST} \sim MVN(A_j, B_j),$$

where

$$B_j = [z'z/V_j + 01I]^{-1} \text{ and } A_j = B_j[z'(\overline{y^{POST*}} - E_j)/V_j],$$

where E_{ijk} (V_j) is the conditional mean (variance) of ε_{ijk}^{POST}, conditioning on $\varepsilon_{ij'k}^{POST}$ and $j' \neq j$

7. Generate $\overline{\theta^{PRE}}$

$$\overline{\theta^{PRE}} \sim MVN(W, P)$$

where

$$W = P\left(\sum_{i=1}^{N} \theta_i^{PRE}/N + D_0^{-1}\theta_0\right) \text{ and}$$

$$P = [D_0^{-1} + N(\Sigma^{PRE})^{-1}]^{-1},$$

where $\theta_0 = (0, 0, \quad , 0)'$ and $D_0 = 100I$

8. Generate Γ

$$\theta_i^{POST} = \alpha S_i + \Gamma\theta_i^{PRE} + \eta_i^{POST}$$

can be written as

$$\delta = Z\gamma + \eta,$$

where

$$\delta = (\theta_1^{POST\prime} - \alpha S_1', \theta_2^{POST\prime} - \alpha S_2', \quad , \theta_N^{POST\prime} - \alpha S_N')',$$

$$Z = (I \otimes \theta_1^{PRE\prime}, I \otimes \theta_2^{PRE\prime}, \quad , I \otimes \theta_N^{PRE\prime})',$$

$$\gamma = vec(\Gamma') = (\gamma_1', \gamma_2', \quad , \gamma_J')' \sim MVN(0, 100I), \text{ and}$$

$$\eta = (\eta_1^{POST\prime}, \eta_2^{POST\prime}, \quad , \eta_N^{POST\prime})'$$

The posterior distribution of γ is

$$\gamma \sim MVN(\gamma^*, \Omega^*),$$

$$\gamma^* = \Omega^* Z'[I \otimes (\Sigma^{POST})^{-1}]\delta, \text{ and}$$

$$\Omega^* = (\{Z'[I \otimes (\Sigma^{POST})^{-1}]Z\} + 01I)^{-1}$$

9. Generate α

$$\theta_{ij}^{POST} = \alpha_j S_i + \Gamma_j\theta_i^{PRE} + \eta_{ij}^{POST}, \quad j = 1, \quad , 2J,$$

where Γ_j is the jth row of the matrix Γ Then, generate

$$\alpha_j \sim MVN(W_j, P_j),$$

where

$$P_j = [S_i'S_i(\Sigma_j^{POST})^{-1} + 01]^{-1} \text{ and}$$

$$W_j = P_i[S_i'(\theta_{ij}^{POST} - \Gamma_j\theta_i^{PRE})/\Sigma_j^{POST}]$$

10. Generate Σ^{PRE}

$$\Sigma_j^{PRE} \sim \text{Inverted gamma } (a_j, b_j), \quad j = 1, \quad , 2(J - 1),$$

where

$$a_j = s_0 + \frac{N}{2} \ (s_0 = 2), \text{ and}$$

$$b_j = \frac{2}{\sum_{i=1}^{N} (\theta_{ij}^{PRE} - \overline{\theta_j^{PRE}})^2 + 2/q_0} \qquad (q_0 = 5)$$

11. Generate Σ^{POST}

$$\Sigma_j^{PRE} \sim \text{Inverted gamma } (a_j, b_j), \quad j = 1, \quad , 2J,$$

where

$$a_j = s_0 + \frac{N}{2} \ (s_0 = 2) \text{ and}$$

$$b_j = \frac{2}{\sum_{i=1}^{N} (\theta_{ij}^{POST} - \alpha_j S_i - \Gamma_j\theta_i^{PRE})^2 + 2/q_0} \qquad (q_0 = 5)$$

12. Generate R^{PRE}

We define

$$V_{ijk} = y_{ijk}^{PRE*} - \theta_{ijk}^{PRE}X_{ijk}^{PRE} - \beta_{j1}^{PRE}Time_{ik} - \beta_{j2}^{PRE}Session_{ik},$$

$$l(R^{PRE}) \propto |R^{PRE}|^{-n/2}\exp\left(-5\sum_{i=1}^{N}\sum_{k=1}^{K_i} V_{ik}'R^{PRE-1}V_{ik}\right),$$

$$vec(R^{PRE}) \sim MVN(0, I), \text{ and}$$

$$R_{new}^{PRE} = R_{old}^{PRE} + H, \text{ where } H_{ii} = 0$$

Then, generate a sequence of i i d standard normal deviates of $w_{12}, w_{13}, \quad , w_{J-2,J-1}$ Then, generate a deviate d from $N(0, \sigma_d^2)$, such that $-\varsigma/\sqrt{2} < d < \varsigma/\sqrt{2}$, where ς is the smallest eigenvalue of R^{PRE} and σ_d^2 is a fine-tune parameter (in our context, $\sigma_d = 05$), and form

$$H_{ij} = \frac{dw_{ij}}{\sqrt{\sum_{j=1}^{J-2}\sum_{l=j+1}^{J-1} w_{jl}^2}}$$

The candidate R_{new}^{PRE} is accepted or rejected on the basis of the following Metropolis–Hastings acceptance probability

$$\min\left\{\frac{l(\mathrm{R}_{\mathrm{new}}^{\mathrm{PRE}})\mathrm{p}[\mathrm{vec}(\mathrm{R}_{\mathrm{new}}^{\mathrm{PRE}})]\left[\Phi\left(\frac{\varsigma_{\mathrm{new}}}{\sqrt{2}\sigma_{\mathrm{d}}}\right)-\Phi\left(\frac{-\varsigma_{\mathrm{new}}}{\sqrt{2}\sigma_{\mathrm{d}}}\right)\right]}{l(\mathrm{R}_{\mathrm{old}}^{\mathrm{PRE}})\mathrm{p}[\mathrm{vec}(\mathrm{R}_{\mathrm{old}}^{\mathrm{PRE}})]\left[\Phi\left(\frac{\varsigma_{\mathrm{old}}}{\sqrt{2}\sigma_{\mathrm{d}}}\right)-\Phi\left(\frac{-\varsigma_{\mathrm{old}}}{\sqrt{2}\sigma_{\mathrm{d}}}\right)\right]}, 1\right\},$$

where $\Phi(\,)$ is the standard normal cumulative distribution function

13. Generate R^{POST}

Finally, generate R^{POST} the same way that R^{PRE} is generated in Step 12

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Steven H. Seggie & David A. Griffith

What Does It Take to Get Promoted in Marketing Academia? Understanding Exceptional Publication Productivity in the Leading Marketing Journals

Institutional competition to retain and recruit marketing scholars capable of publishing in the leading marketing journals has intensified. Although increased emphasis has been placed on publication productivity in the leading marketing journals, little is known about questions such as (1) What level of publication productivity in the leading marketing journals does it take to get promoted in marketing academia? (2) What level of publication productivity in the leading marketing journals warrants exception? and (3) What drives research productivity in the leading marketing journals? The authors draw on the economic concept of imperfect substitution to address these questions using two data sets: (1) a census of publication activity in the leading marketing journals of 337 scholars in the top 70 institutions who were promoted between 1992 and 2006 and (2) an examination of 2672 scholars who published 3492 articles in the four leading marketing journals over the 1982–2006 period. The results indicate that the average number of publications by successful candidates for promotion to associate professor from PhD conferral at the top 10 institutions was .57 articles in the leading marketing journals per year, compared with .47 in the top 11–20 institutions, .47 in the top 21–40 institutions, and .26 in the top 41–70 institutions. The authors also present findings related to promotion to full professor both from PhD conferral and from promotion to associate professor, as well as scholars identified as warranting exceptional publication productivity. The findings provide substantive implications for marketing academics, for those involved with the recruitment and retention of marketing academics, and for the field of marketing thought in general.

Keywords: marketing academia, scientometrics, imperfect substitution, publication productivity, career advancement

Promotion in academia is an institutional governance mechanism employed to retain, at the junior level, and recruit, at the senior level, marketing scholars.[1] Because the development of the science and practice of marketing is driven by publications within the field's leading journals (i.e., *Journal of Marketing* [*JM*], *Journal of Marketing Research* [*JMR*], *Journal of Consumer Research* [*JCR*], and *Marketing Science* [*MKS*]), institutions (i.e., marketing departments) work to retain and recruit scholars capable of publication in these journals. However, although publication productivity in the leading marketing journals is an important element in promotion decisions (McAlister 2005), there is a lack of data on this topic. Without data on publication productivity, how can a faculty member's record for promotion be evaluated to determine whether he or she has achieved a level of productivity in the leading marketing journals that sets him or her apart from others in the market? Although this issue is pertinent to assistant and associate professors in the field, the influx of funding for the recruitment of senior scholars through endowed chairs has raised the issue of what level of productivity allows more senior faculty members to stand out among their peers. Without a clear understanding of what exceptional productivity is, it is not possible to assess current and potential faculty or how publication productivity leads to career advancement.

Given these issues, this study works to examine three research questions: (1) What level of publication productiv-

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[1] In this study, promotion refers to a promotion from assistant professor to associate professor and from associate professor to full professor.

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ity in the leading marketing journals does it take to get promoted in marketing academia? (2) What level of publication productivity in the leading marketing journals warrants exception? and (3) What drives research productivity in the leading marketing journals? To examine these questions, this study draws on the economic concept of imperfect substitution and builds on research within scientometrics (i e , the measurement and analysis of science) on the drivers of research productivity (e g , Gupta, Kumar, and Aggarwal 1999, Nwagwu 2006, Prpic 1996) We empirically examine the research questions using two data sets (1) a census of publication activity in the leading marketing journals of 337 scholars in the top 70 institutions promoted between 1992 and 2006 and (2) an examination of 2672 scholars who collectively published 3492 articles in the four leading marketing journals during the 1982–2006 period The findings provide implications for marketing academics and for those involved with the recruitment and retention of marketing academics

Background Literature

Rankings incorporating research productivity (e g , *Financial Times* business school rankings, Trieschmann et al 2000) have received increased attention as competition among business schools to attract quality faculty and students, endowments, and so forth, has intensified In the field of marketing, this is exemplified by an increased interest in quantifying contributions of marketing scholarship (e g , Bakir, Vitell, and Rose 2000, Baumgartner and Pieters 2003, Cheng, Chan, and Chan 2003, Mittal, Feick, and Murshed 2008, Stremersch and Verhoef 2005, Stremersch, Verniers, and Verhoef 2007, Tellis, Chandy, and Ackerman 1999) The issue of quantifying contributions is most observable in promotion decisions [2]

Although promotion decisions weigh many aspects of a faculty member's academic portfolio (Bartels 1983, Beltramini, Schlacter, and Kelley 1985), a central criterion at research institutions is publication productivity in the leading marketing journals (McAlister 2005) Promotion decisions not only are about rewarding past publication success but also include attempts by an institution to retain talent to maintain and build competitive positioning By granting a promotion, an institution works to increase the switching costs of its marketing faculty (e g , granting a promotion to an associate professor binds the person to the institution because rank and tenure are not always portable, and the psychic costs of giving up rank or tenure are substantial)

Underlying the promotion decision is the economic concept of imperfect substitution—that is, when lesser talent is a poor substitute for greater talent (Murphy, Shleifer, and Vishny 1991, Rosen 1981) Imperfect substitution occurs when two products are perceived as being different in relation to a set of desired qualities and therefore have different demand curves in a specific market (Rosen 1981) For example, it could be argued that at a top 10 institution, an assistant professor who has published one article in the leading marketing journals is a poor substitute for another assistant professor, current or future, who has published five articles in the same journals Rosen (1981) argues that imperfect substitution conditions an assignment problem between buyers and sellers, contending that the greater the skew in talent distribution within a market, the larger is the skew in the distribution of rewards [3]

Within the field of marketing, the assignment problem associated with imperfect substitution, and its relationship to limited talent within the market, is most clearly observable in the promotion rates from assistant professor to associate professor Specifically, research institutions recruit newly minted PhDs on the basis of perceived talent (i e , the scholar is capable of publishing in the leading marketing journals) Those who are capable of successfully publishing to a set level of institutional expectations in the leading marketing journals are promoted from assistant professor to associate professor Those who do not meet expectations are released, and the market reassigns them to another institution When an assignment problem has occurred, the institution reenters the market and works to attract a more qualified substitute Notably, although the retention of junior marketing faculty developing into highly productive publishers in the leading marketing journals is central to enhancing an institution's competitive positioning (see Siemens et al 2005), limited data exist to assist marketing faculty with assessing the assignment decision As such, we explore the question of what level of publication productivity in the leading marketing journals it takes to get promoted

Furthermore, we explore the assignment problem associated with imperfect substitution and its relationship to limited talent within the broader market Specifically, the increased competitive environment for marketing faculty has stimulated the development of a large number of endowed positions Typically, endowed positions are reserved to attract and retain faculty members, who, through their past and expected future publications in the leading marketing journals, assist the institution in enhancing its competitive positioning However, the employment of endowed chairs within the governance structure of promotion necessitates a clear understanding of the level of productivity in the leading marketing journals that warrants distinction (i e , identification of exceptionally prolific scholars) As such, in this study, we also explore the issue of what level of publication in the leading marketing journals warrants exception

Finally, it is important to examine drivers of publication productivity in the leading marketing journals A stream of scientometric investigation focuses on research productivity (e g , Gupta, Kumar, and Aggarwal 1999, Long et al 1998, Nwagwu 2006, Prpic 1996) This line of scientometric inquiry is consistent with Rosen's (1981) emphasis on imperfect substitution Thus, building on this literature, we examine academic training and gender as potential drivers of publication productivity in the leading marketing journals

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[2] Here, promotion decisions are not conceptually restricted to internal institutional aspects, they are also considered external to the institution For example, scholars are often recruited from one institution to another by means of promotion from a lower rank to a higher rank (e g , associate professor to full professor)

[3] The perspective of a skewed talent distribution, as conceptualized by Rosen (1981), can be argued to be consistent with the talent distribution in the field of marketing, in which (1) most marketing academics publish very few articles overall when considering the broad range of journals (see Powers et al 1998) and (2) academics receive different financial rewards by publishing in different outlets, as Mittal, Feick, and Murshed (2008) note

Method

Journal Selection

The leading journals in marketing are *JM*, *JMR*, *JCR*, and *MKS* (Lehmann 2005, McAlister 2005, Stremersch, Verniers, and Verhoef 2007) The identification of these journals as the leading journals in the field of marketing is consistent with Theoharakis and Hirst's (2002) findings and Tellis, Chandy, and Ackerman's (1999) and Mittal, Feick, and Murshed's (2008) applications of the leading marketing journals Furthermore, the journals selected are consistent with the focus of this study For example, McAlister (2005) notes that tenure and promotion decisions are directly related to publication in a common set of leading marketing journals and that these journals are an exclusive set consisting of *JM*, *JMR*, *JCR*, and *MKS*

Data Set for Research Question 1: What Level of Publication Productivity in the Leading Marketing Journals Does It Take to Get Promoted in Marketing Academia?

To examine the question of what it takes to get promoted in marketing academia, we generated a census of the publication activity in the four leading marketing journals of 337 scholars promoted to associate professor and/or full professor in the top 70 institutions from 1992 to 2006 We selected this period (1) to be consistent with prior research that has examined productivity among marketing faculty (e g , Powers et al 1998) and (2) to reflect recent promotion decisions, thus reflecting the contemporary academic context

Next, given the nature of the assignment problem regarding imperfect substitution, we deemed it important to segment institutions because institutions of different academic levels were predicted to have different publication expectations for promotion decisions Trieschmann and colleagues (2000) provide a ranking of marketing departments based on research productivity in three of the four leading marketing journals (i e , *JM*, *JMR*, and *JCR*) We employed Trischmann and colleagues' ranking for the top 70 marketing departments and segmented institutions into (1) top 10, (2) top 11–20, (3) top 21–40, and (4) top 41–70 [4]

We sourced marketing faculty publication and promotion data through multiple avenues We searched departmental Web sites at each of the identified institutions and secured current curriculum vitae of faculty when possible When curriculum vitae were not available online, we sourced publication records through ABI/INFORM and journal tables of contents, among other sources When specific promotional dates were unclear, we contacted institutions and individuals directly and, in some cases, made requests for promotion information under the Freedom of Information Act [5]

We calculated the number of publications per year from PhD conferral to promotion to associate professor, from PhD conferral to promotion to full professor (when applicable), and from promotion to associate professor to promotion to full professor (when applicable) for each scholar In total, the data set for Research Question 1 consisted of 337 unique marketing faculty segmented by institution top 10 (N = 75), top 11–20 (N = 64), top 21–40 (N = 93), and top 41–70 (N = 116) [6]

Data Set for Research Question 2: What Level of Publication Productivity in the Leading Marketing Journals Warrants Exception?

To examine the question of what level of publication warrants exception, we assessed publication rate in the leading marketing journals Following prior work on publication productivity (e g , Inkpen and Beamish 1994), we restricted the sample to research articles published in the four leading marketing journals over the 1982–2006 period, excluding editorials, obituaries, and articles labeled as comments on other people's work Although some of these excluded articles advance the field and represent contributions, we excluded them as a class to maintain consistency The starting year coincided with the introduction of *MKS* into the field We sourced the tables of contents of each journal for the 25-year period We coded each article to identify the authors contributing to the work, thus providing an author appearance Following Bakır, Vitell, and Rose (2000) and Inkpen and Beamish (1994), we then tabulated an "adjusted authorship appearance" score Adjusted authorship appearance accounts for multiple author articles For example, an author received a score of 1 for a single-authored work, and in a published article with two authors, each author received a score of 5, likewise, for an article with three authors, each author received a score of 333, and so on

Next, we expanded the data set by sourcing the year each scholar was awarded his or her PhD and, when pertinent, the year of retirement or passing We used this information to calculate how many years each scholar was active during the 25-year period [7] We assumed that the date of the awarding of the PhD was the midpoint of the year, for example, if a scholar received his or her PhD in 1982 and did not retire or pass away before the end of 2006, we calculated him or her as active for 24 5 years (i e , 24 years [1983–2006 inclusive] plus half a year in 1982) Likewise, if a scholar received his or her PhD in 1993 and did not retire or pass away before the end of 2006, we calculated him or her as active for 13 5 years (i e , 13 years [1994–2006 inclusive] plus half a year in 1993) If a scholar received his or her PhD before 1982 and did not retire or pass away before the end of 2006, we calculated him or her as being active for the full 25 years If a scholar retired or passed away before the end of the 25-year period, we factored this into the calculation of the active number of years For example, if a scholar received his or her PhD before 1982 and retired in 1995, we took the end of 1995 as the end date of that scholar's active period and calculated the number of years active as 14 The one exception to this process is if a scholar continued to publish articles in the four leading marketing journals after retirement/passing, in which case we took the end date of that scholar's active period to be the date of the last publication

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[4] We contacted Trieschmann and colleagues (2000) to obtain the ranking for the top 70 institutions because their article presents information only for the top 50 institutions

[5] Despite our best efforts, we were not able to obtain the month of graduation or promotion in most cases In general, the information was not available online, people could not remember, and so on Therefore, we set awarding of the PhD to a standard date of June 1, reasoning that, in general, people graduate at the end of the spring semester Furthermore, we set the date of promotion to September 1, reasoning that most promotions become effective at the beginning of the fall semester

[6] Because some scholars changed institutions across and within tiers, in some cases, we counted scholars multiple times, therefore, the summation of the specific Ns per tier does not total to 337, but rather to 348

[7] We define the "active" status as having received a PhD and not having retired or passed away

Data Set for Research Question 3: What Drives Research Productivity in the Leading Marketing Journals?

To examine the drivers of research productivity in the leading marketing journals, we built on the data set of scholars used to examine Research Question 2 Building on prior work in the scientometric study of publication productivity, we sourced information for the scholars examined in Research Question 2 pertaining to (1) the tier of each scholar's PhD-granting institution (e g , Long et al 1998) and (2) gender (see Prpic 2002)

Analysis and Results

Research Question 1: What Level of Publication Productivity in the Leading Marketing Journals Does It Take to Get Promoted in Marketing Academia?

Research Question 1 assesses the publication productivity in the leading marketing journals that is necessary for promotion from assistant professor to associate professor and from associate professor to full professor We calculated descriptive statistics (see Table 1) on a per-year basis and as a normalized average (to account for differences in years to promotion across individuals and institutions) for conferral of PhD to promotion to associate professor, from conferral of PhD to promotion to full professor, and from promotion to associate professor to promotion to full professor, we used a 6-year time frame for the normalization of conferral of PhD to promotion to associate professor and promotion to associate professor to promotion to full professor (i e , average per year multiplied by 6) and a 12-year time frame for the normalization of conferral of PhD to promotion to full professor (i e , average per year multiplied by 12)

The results indicate that from conferral of PhD to promotion to associate professor, successful promotion candidates in the top 10 institutions published an average of 57 articles in the leading marketing journals per year, compared with 47 in the top 11–20 institutions, 47 in the top 21–40 institutions, and 26 in the top 41–70 institutions Furthermore, the results from conferral of PhD to promotion to full professor indicate that successful promotion candidates at the top 10 institutions published an average of 59 articles in the leading marketing journals per year, compared with 48 in the top 11–20 institutions, 42 in the top 21–40 institutions, and 27 in the top 41–70 institutions Finally, the results from time of promotion to associate professor to time of promotion to full professor indicate that successful promotion candidates at the top 10 institutions published an average 61 articles in the leading marketing journals per year, compared with 43 in the top 11–20 institutions, 35 in the top 21–40 institutions, and 24 in the top 41–70 institutions

We also analyzed whether there were any changes over time with regard to average-per-year publications for promotion for the different tiers of institutions For each tier, we split the sample into three equal periods (1) 1992–1996, (2) 1997–2001, and (3) 2002–2006[8] We conducted an analysis of variance (ANOVA) to check for equality of means across periods[9] The results of the analysis show that for the top 10 and top 11–20 tiers, there was no change across time in the average-per-year publications for successful candidates for promotion For the top 21–40 tier, the

TABLE 1

Publication Productivity in the Four Leading Marketing Journals Across Institutions: 1992–2006

	Conferral of PhD to Promotion to Associate Professor			Conferral of PhD to Promotion to Full Professor			From Promotion to Associate Professor to Promotion to Full Professor		
	Per-Year Average	SD	Normalized Average	Per-Year Average	SD	Normalized Average	Per-Year Average	SD	Normalized Average
Top 10	57	73	3 39	59	77	7 05	61	79	3 68
Top 11–20	47	63	2 82	48	64	5 76	43	64	2 58
Top 21–40	47	66	2 82	42	58	4 99	35	54	2 09
Top 41–70	26	48	1 57	27	49	3 21	24	49	1 46

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[8] We also split the sample according to a median split However, the substantive results were similar, and we believe that the analysis of the split into three groups provides more information, therefore, we report results of the analysis of the split into three groups

[9] The sample size was large enough that the ANOVA was robust to violations of the normal distribution assumption, however, as a control, we also conducted the Brown–Forsythe test of equality of means There was no conflict between the results of the ANOVA and the Brown–Forsythe test for all analyses

average number of publications per year from PhD conferral to promotion to associate professor was different for the three groups (F(2, 512) = 4 05, $p <$ 05) The results of the Tukey test demonstrate that average-per-year publications decreased from the 1992–1996 period (57) to the 2002–2006 period (42) However, the average-per-year publications from PhD conferral to promotion to full professor and for the promotion to full professor from promotion to associate professor showed no significant change over the three periods For the top 41–70 tier, the average number of publications per year from PhD conferral to promotion to associate professor was different for the three groups (F(2, 616) = 4 42, $p <$ 05) The results of the Games–Howell test demonstrate that the average-per-year publications increased from the 1992–1996 period (21) to the 1997–2001 period (32) [10] However, the average number of publications per year from PhD conferral to promotion to full professor and for the promotion to full professor from promotion to associate professor showed no significant change over the three periods

Furthermore, examination of the normalized average number of publications and the normalized range for each stage of promotion indicates considerable variance in publications for all levels of promotion [11] For example, the normalized average number of publications from conferral of PhD to promotion to associate professor was 3 39, with a normalized range from 00 to 8 00 for the top 10 institutions, 2 82, with a normalized range from 00 to 7 20 for the top 11–20 institutions, 2 82, with a normalized range from 00 to 9 00 for the top 21–40 institutions, and 1 57, with a normalized range from 00 to 7 50 for the top 41–70 institutions Similarly, the normalized average number of publications from conferral of PhD to promotion to full professor was 7 05, with a normalized range from 1 09 to 16 00 for the top 10 institutions, 5 76, with a normalized range from 00 to 13 20 for the top 11–20 institutions, 4 99, with a normalized range from 00 to 12 00 for the top 21–40 institutions, and 3 21, with a normalized range from 00 to 16 00 for the top 41–70 institutions Finally, the normalized average number of publications from promotion to associate professor to promotion to full professor was 3 68, with a normalized range from 00 to 12 00 for the top 10 institutions, 2 58, with a normalized range from 00 to 9 00 for the top 11–20 institutions, 2 09, with a normalized range from 00 to 8 00 for the top 21–40 institutions, and 1 46, with a normalized range from 00 to 6 00 for the top 41–70 institutions

Research Question 2: What Level of Publication Productivity in the Leading Marketing Journals Warrants Exception?

Research Question 2 examines what level of publication productivity warrants exception when considering the leading marketing journals We conducted multiple analyses to explore this question The first analysis was a calculation of the average number of publications for each scholar per year active (R_i), in which subscript "i" represents an individual scholar To conduct this analysis, it was necessary to exclude (1) scholars without a PhD (N = 124, $\mu_{\text{Publications}}$ = 1 12, minimum = 1, maximum = 4), because the granting date of the PhD provides data regarding time active from 1982 to 2006, (2) scholars for whom we were unable to identify PhD-granting dates or retirement dates (when appropriate) (N = 72, $\mu_{\text{Publications}}$ = 1 26, minimum = 1, maximum = 4), despite contacting individual scholars, universities, and coauthors, and (3) scholars who received their PhD after 2001 or retired or passed away within the first four years of our data set (N = 219, $\mu_{\text{Publications}}$ = 1 36, minimum = 1, maximum = 5), because Research Question 2 examines exceptional performance over a career, and we contend that a minimum of five years is necessary to establish a record on which a trend can be determined In all, we retained a total of 2257 scholars in our data set to calculate R_i We then sorted scholars according to their R_i The findings indicate that 79 75% of retained scholars had an R_i between 040 and 275, 10 23% had an R_i between 276 and 464, 7 44% had an R_i between 465 and 799, and 2 57% had an R_i between 800 and 1 697 The 58 most prolific scholars according to R_i appear in Table 2

Next, we calculated adjusted publication activity per scholar per year active (adjusted R_i), thus adjusting for the number of coauthors To conduct this analysis, it was necessary to exclude the same scholars we excluded in the calculation of R_i, again leaving 2257 scholars in our data set We sorted scholars according to their adjusted R_i The results indicate that 79 53% of retained scholars had an adjusted R_i between 006 and 126, 10 46% had an adjusted R_i between 127 and 214, 7 80% had an adjusted R_i between 215 and 400, and 2 22% had an adjusted R_i between 402 and 1 105 The 50 most prolific scholars according to adjusted R_i appear in Table 3

Furthermore, we conducted an unadjusted publication count of the 2672 scholars to identify the most prolific scholars according to unadjusted count in the period from 1982 to 2006 in the leading marketing journals In relation to unadjusted count, 78 26% of scholars had an unadjusted count of between 1 and 3, 11 53% had an unadjusted count between 4 and 6, 8 35% had an unadjusted count between 7 and 14, and 1 87% had an unadjusted count greater than 14 The 50 most prolific scholars according to unadjusted count between 1982 and 2006 appear in Table 4 [12]

Research Question 3: What Drives Research Productivity in the Leading Marketing Journals?

Research Question 3 works to understand the drivers of research productivity in the leading marketing journals Building on the extant literature in scientometrics (e g , Gupta, Kumar, and Aggarwal 1999, Long et al 1998,

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[10] We used the Games–Howell post hoc test because the assumption of homogeneous variance was violated

[11] The normalized range is the range from the lowest individual scholar normalized average to the highest individual scholar normalized average

[12] Note that though the calculation of R_i and adjusted R_i adjusts for the time a scholar is in the sample, Table 4 represents an overall productivity measure across the full 1982–2006 period and therefore is unadjusted for time Furthermore, Table 4 does not account for these scholars' pre-1982 publications

TABLE 2
Top 58 Most Prolific Scholars in the Leading Marketing Journals During 1982–2006 by Publication Rate (R_i): PhD Received Before 2002

Scholar	Publication Rate	Scholar	Publication Rate
Pradeep K Chintagunta	1 697	Wayne S DeSarbo	920
Stefan Stremersch	1 636	John R Hauser	920
Michel Wedel	1 515	Peter C Verhoef	909
Ran Kivetz	1 385	Kenneth H Wathne	909
Vikas Mittal	1 263	Ravi Dhar	897
Donald R Lehmann	1 200	Gita Venkataramani Johar	889
Itamar Simonson	1 179	Carl Mela	880
Alexander Chernev	1 158	Priya Raghubir	880
Greg M Allenby	1 135	Roland T Rust	880
Chris A Janiszewski	1 128	Jan B Heide	872
Morris B Holbrook	1 120	Jennifer L Aaker	870
Gerard J Tellis	1 106	Gavan J Fitzsimons	870
Craig J Thompson	1 103	Dhruv Grewal	857
Paul E Green	1 063	Ganesh Iyer	857
Rajdeep Grewal	1 059	Baba Shiv	857
Aric Rindfleisch	1 059	Vijay Mahajan	840
Dilip Soman	1 053	Sunil Gupta	829
Stephen M Nowlis	1 040	Darren W Dahl	824
J Jeffrey Inman	1 030	Puneet Manchanda	824
Jan-Benedict E M Steenkamp	1 029	Duncan I Simester	815
Christine Moorman	1 027	William O Bearden	800
Barbara E Kahn	1 022	Yuxin Chen	800
Richard Staelin	960	William R Dillon	800
Rajesh K Chandy	952	Claes Fornell	800
Joseph C Nunes	941	Frenkel ter Hofstede	800
Wagner A Kamakura	936	Donald G Morrison	800
Harald J van Heerde	933	Laura A Peracchio	800
Joan Meyers-Levy	927	Werner J Reinartz	800
Jean-Pierre Dubé	923	V Srinivasan	800

Nwagwu 2006, Prpic 1996), we explored publication productivity on the basis of a faculty member's institution of academic training and gender

We conducted an ANOVA and the Brown–Forsyth test of equality of means to examine this research question[13] The results of these analyses appear in Tables 5 and 6 The ANOVA and Brown–Forsyth test of equality of means for different ranks of institution of academic training indicated a difference in mean publication rate (F(4, 2252) = 16 82, $p < 001$, F*(4, 2136 62) = 17 13, $p < 001$)[14] Because of unequal variance across groups and unequal group size, we used the Games–Howell test to determine which means were different The results of the Games–Howell test indicate that graduates of the top 10 institutions had a higher publication rate than those from the top 21–40 institutions ($p < 001$), the top 41–70 institutions ($p < 001$), and other institutions ($p < 001$) Likewise, graduates from the top 11–20 institutions had a higher publication rate than those from the top 21–40 institutions ($p < 1$), the top 41–70 institutions ($p < 001$), and other institutions ($p < 001$) We found no other differences across institutions of academic training The results of the ANOVA and the Brown–Forsyth test of equality of means indicate no influence of gender on publication rate (F(1, 2255) = 1 07, $p > 1$, F*(1, 755 27) = 1 26, $p > 1$)

Discussion

This research was motivated by three research questions The results of the analysis of publication productivity in the four leading marketing journals help answer these questions and provide implications for marketing academics and the institutions in which they are employed

Research Question 1: What Level of Publication Productivity in the Leading Marketing Journals Does It Take to Get Promoted in Marketing Academia?

The results provide evidence of scholarly publication within the leading marketing journals and provide a foundation for the discussion of publication expectations As we argued previously, institutions not only strive to enhance their intel-

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[13] The sample size was large enough that the ANOVA was robust to violations of the normal distribution assumption, however, as a control, we also conducted the Brown–Forsythe test of equality of means There was no conflict between the results of the ANOVA and the Brown–Forsythe test for all analyses We conducted additional nonparametric tests, and they also provided the same substantive results as the ANOVA

[14] F* represents the Brown–Forsyth statistic for the test of equality of means

TABLE 3
Top 50 Most Prolific Scholars in the Leading Marketing Journals During 1982–2006 by Adjusted Publication Rate (Adjusted R_I): PhD Received Before 2002

Scholar	Adjusted Publication Rate	Scholar	Adjusted Publication Rate
Alexander Chernev	1 105	Stephen M Nowlis	453
Pradeep K Chintagunta	863	Jan B Heide	453
Ran Kivetz	795	Jean-Pierre Dubé	449
Craig J Thompson	678	Kevin Lane Keller	443
Itamar Simonson	658	Gavan J Fitzsimons	442
Morris B Holbrook	653	Priya Raghubir	440
Stefan Stremersch	636	Aric Rindfleisch	431
Chris A Janiszewski	624	J Miguel Villas-Boas	430
Dilip Soman	614	Aradhna Krishna	429
Michael Lewis	606	Laura A Peracchio	429
Michel Wedel	596	J Jeffrey Inman	424
Joan Meyers-Levy	561	Robert V Kozinets	421
Christine Moorman	554	Wagner A Kamakura	420
Gerard J Tellis	553	Gita Venkataramani Johar	420
Jennifer L Aaker	536	Barbara E Kahn	418
Greg M Allenby	527	John R Hauser	413
Donald R Lehmann	486	Ganesh Iyer	413
Peter C Verhoef	485	K Sudhir	412
Elizabeth C Hirschman	480	Lisa E Bolton	410
Joseph C Nunes	475	Michel Tuan Pham	407
Erica Mina Okada	467	Claes Fornell	405
Paul E Green	463	Zeynep Gurhan-Canli	403
Birger Wernerfelt	463	Ann E Schlosser	403
Ravi Dhar	460	Rajdeep Grewal	402
Vikas Mittal	456	David Glen Mick	402

lectual environment but also set forth an expected position (i e , ranking, within the greater academic community) The results indicate that expectations for faculty productivity are related to the rank within the select institutions at the time of promotion For example, the top 10 institutions expect more than twice as many publications per year in the leading marketing journals than institutions ranking in the top 41–70 This general proportion across institutional segments holds for promotion to full professor from promotion to associate professor and for overall expected publications in the leading marketing journals for promotion to full professor from the conferral of the PhD The results are consistent with the economic concept of imperfect substitution (Rosen 1981) in that higher-tier institutions view marketing faculty with lower productivity in the leading marketing journals as imperfect substitutes, thus conditioning reassignment to lower ranking institutions in which the productivity level of the faculty member is more closely aligned

Although these findings provide some insight into how many leading marketing journal articles it takes to get promoted at the top 70 marketing institutions, the range in number of leading marketing publications among those promoted suggests that promotion is not purely dictated by a hard-and-fast rule pertaining to number of publications in the leading marketing journals (e g , five publications in five years), thus suggesting, consistent with Wilkie (2005), that institutions consider other factors beyond simply leading marketing journal publications in promotion decisions (e g , quality of publications, scholarly impact, teaching quality, national reputation) (see Bartels 1983, Beltramini, Schlacter, and Kelley 1985) Although many aspects go into promotion decisions, to understand the publication aspect of this issue further, we expanded our investigation to explore publication productivity more fully Specifically, Lehmann (2005) indicates that in some areas of marketing, faculty members have begun publishing in discipline journals (e g , *Journal of Applied Psychology*), viewing leading journals in psychology or economics as at least equal to, and in some cases better than, publication in leading marketing journals As such, we expanded our investigation using the ranking of leading nonmarketing journals employed by Mittal, Feick, and Murshed (2008) to provide a broader examination of marketing faculty publication productivity

The expanded analysis found a similar pattern to the leading marketing journal analysis across institutional tiers Specifically, in the examination of promotion to associate professor from conferral of PhD, the findings indicate that the average number of published articles of successful promotion candidates at the top 10 institutions increased from 57 leading marketing journal publications per year to 82 leading journal publications per year Similarly, for institutions ranked in the top 11–20, the average number of articles published rose from 47 when considering only leading marketing journals to 62 when considering all leading journals For promotion to full professor from conferral of PhD, the average number of articles published by successful promotion candidates in the top 10 institutions rose from 59

TABLE 4
Top 50 Most Prolific Scholars in the Leading Marketing Journals: Articles Published During 1982–2006

Scholar	Published Articles	Scholar	Published Articles
Donald R Lehmann	30	John G Lynch Jr	18
Pradeep K Chintagunta	28	Jan-Benedict E M Steenkamp	18
Morris B Holbrook	28	Birger Wernerfelt	18
Gerard J Tellis	26	Joseph W Alba	17
Michel Wedel	25	Russell W Belk	17
Richard Staelin	24	Hubert Gatignon	17
Wayne S DeSarbo	23	Paul E Green	17
John R Hauser	23	Sunil Gupta	17
Barbara E Kahn	23	Jan B Heide	17
Itamar Simonson	23	J Jeffrey Inman	17
Chris A Janiszewski	22	George John	17
Wagner A Kamakura	22	Scott A Neslin	17
Roland T Rust	22	Charles B Weinberg	17
Greg M Allenby	21	Shelby D Hunt	16
Vijay Mahajan	21	Deborah Roedder John	16
William O Bearden	20	Lakshman Krishnamurthi	16
William R Dillon	20	Craig J Thompson	16
Claes Fornell	20	Russell S Winer	16
Donald G Morrison	20	William Boulding	15
V Srinivasan	20	Gary L Frazier	15
Wayne D Hoyer	19	Dhruv Grewal	15
Joan Meyers-Levy	19	Gary L Lilien	15
Christine Moorman	19	Durairaj Maheswaran	15
Jehoshua Eliashberg	18	Robert J Meyer	15
Stephen J Hoch	18	Brian Sternthal	15

TABLE 5
Results of the ANOVA and the Brown–Forsyth Test of Equality of Means for Institution of Academic Training Tier

	Top 10	Top 11–20	Top 21–40	Top 41–70	Other	f	Brown–Forsyth Statistic
N	511	419	474	382	471		
Publication rate	235	206	175	149	144	16 82*	17 13*

*$p < 001$

TABLE 6
Results of the ANOVA and the Brown–Forsyth Test of Equality of Means for Gender

	Female	Male	f	Brown–Forsyth Statistic
N	443	1814		
Publication rate	175	186	1 07	1 26

leading marketing journal publications per year to 79 when considering all leading journals and increased from 48 to 59 for institutions ranked in the top 11–20 Finally, for promotion to full professor from promotion to associate professor, the average number of published articles of successful promotion candidates in the top 10 institutions rose from 61 leading marketing journal publications per year to 79 when considering all leading journals and increased from 43 to 52 when examining institutions ranked in the top 11–20 These results suggest that institutions consider publications in leading journals outside the four leading marketing journals when making promotion decisions Furthermore, the results of the expanded analysis indicate that institutions set higher publication productivity standards when considering a marketing scholar's complete publication record

Research Question 2: What Level of Publication Productivity in the Leading Marketing Journals Warrants Exception?

To assess the level of publication productivity warranting exception, we examined scholar rate of publication (i e , the number of publications in the leading marketing journals per year since conferral of the PhD) and adjusted rate of publication (i e , scholar rate of publication adjusted for multiple authors) (Tables 2 and 3, respectively) The distribution of rate of publication and adjusted rate of publication is consistent with Rosen's (1981) concept of superstars in that a very small set of scholars substantially outperform the market For example, the top marketing scholars presented in the tables represent a small percentage of all scholars publishing in the leading marketing journals during the specified periods These scholars were able to achieve publication levels in the leading marketing journals at a minimum rate of 800 publications per year (Table 2) This rate is substantially higher than the average publication rate for all scholars studied of 184, as well as the average rate for promotion at the institutions examined, thus indicating a level of exceptional productivity Furthermore, to assess overall productivity warranting exception, we examined scholarly contribution to the leading marketing journals over the 1982–2006 period (Table 4) Each of these scholars contributed 15 or more articles to the leading marketing journals This level of contribution is noteworthy because the average level of contribution of the remaining 2622 scholars (i e , those outside the top 50) contributing to the leading marketing journals over the 1982–2006 period was 2 50, and more than 78% of all scholars publishing in the leading marketing journals published between one and three articles

Research Question 3: What Drives Research Productivity in the Leading Marketing Journals?

Building on the work in scientometrics (e g , Long et al 1998, Prpic 1996, 2002), we explored two specific drivers of publication productivity in the leading marketing journals (1) the scholar's PhD-granting affiliation and (2) the scholar's gender Contrary to the findings of Long and colleagues (1998) and Williamson and Cable (2003), our findings indicate that the level of institution from which a scholar receives his or her academic training can be used as an indicator of potential academic success However, our findings indicate that, on average, only those whose training was obtained at the top 20 institutions had higher publication rates in the leading marketing journals (with differences existing between those who graduated from the top 10 institutions and those who graduated from the top 11–20) As such, our results add greater specificity to the extant scientometrics literature Practically, our results can assist institutions in their use of academic origin as a signal of potential productivity in the leading marketing journals Because institutions often use the PhD-granting institution as a signal of quality, this study provides empirical support and specificity for when academic training may lead to increased publication productivity in the leading marketing journals and when it may not

Finally, we examined the influence of gender on publication productivity in the leading marketing journals Our findings are contrary to those of Prpic (2002) and others (e g , Over 1982, Rogers and Maranto 1989), who show that, on average, female scholars were less productive than their male counterparts Rather, our findings are consistent with those from the field of management (see Park and Gordon 1996, Williamson and Cable 2003), in which gender was not found to be a significant determinant of publication productivity in the context of marketing scholars Because the scholars examined in this study are consistent in discipline with the scholars examined by Park and Gordon (1996) and Williamson and Cable (2003) (i e , business scholars), as opposed to those in the hard sciences, we argue that the inconsistent findings in the scientometrics literature may be the result of cross-discipline effects

Limitations, Future Directions, and Conclusion

Although this study provides several new insights, it is not without its limitations First, although this study focused on the four leading marketing journals, it is important to recognize that marketing scholarship is published in journals outside those included in this study As we noted previously, Lehmann (2005) argues that many marketing scholars target discipline journals Thus, our identification of the average number of publications for successful promotion candidates, as well as overall scholarly productivity in the marketing discipline, is somewhat limited However, consistent with Day and Montgomery (1999), we contend that to maintain the momentum of marketing and to diminish its cessation to other disciplines, the focus on the leading marketing journals is appropriate for this study Furthermore, we contend that marketing faculty are, or should be, stewards of the marketing discipline, which necessitates a focus on the leading journals in marketing because marketing thought development advances more rapidly by publication within the discipline's leading journals than by publication outside the discipline

Second, this work focused solely on the field of marketing as a whole and not on specific subareas of marketing Thus, although this analysis helps clarify levels of exceptional publication productivity, note that *JM*, *JMR*, *JCR*, and *MKS* were developed to serve unique communities of scholars Building on Rosen's (1981) work, Adler (1985) argues that relaxing the assumption of similar consumer tastes across categories allows each category to constitute a market with its own group of stars The view of marketing as composed of separate submarkets can be observed by people who warrant exception within their smaller academic community (focused around a specific journal) Here, two points are relevant First, size of the market is critical to understanding imperfect substitution (Murphy, Schleifer, and Vishny 1991) Murphy, Schleifer, and Vishny (1991) argue that being a superstar in a large market pays off more than being a superstar in a small market Furthermore, they theoretically demonstrate that growth in submarkets provides substantial advantages to the superstars in these submarkets As such, the analysis of submarkets within marketing, through the examination of journal communities, could be argued to be built on theoretical rationale under the economics of superstars Second, it could be argued that different institutions have different preference structures for academics focusing their efforts on specific journals and, therefore, that assignment becomes important Theoretically, this is consistent with the work of Bowbrick (1983), who argues that there is also an aversion effect of preference structure within some categories for certain attributes Applied within the marketing discipline, this would be consistent with some institutions focusing on a specific domain of marketing and working to recruit and retain marketing faculty who demonstrate superior productivity within that specific domain and/or journals and being averse to those of other domains and/or journals Research on this issue could further enhance the understanding of recruitment and retention

Third, the focus of this study was on scholarly productivity, not impact As such, it could be argued that examining either the impact score of the journal or the citation rate for a specific author/article may increase the understanding of those influencing the field of marketing For example, Stremersch, Verniers, and Verhoef (2007) denote specific drivers of article citation and find that highly productive authors have more citations However, although citations serve as one measure of impact, citational analysis assumes that the citations of a specific article are being made for substantive purposes (i e , the normative theory of citation), which may not be the case As such, one research question that could be examined is whether the most prolific authors in the field are those who influence the development of the field through substantive citations or whether the substantive advances in marketing are made by less prolific authors For example, one way to determine whether citations are substantive is to apply the rule of "must be cited more than once" within an article An alternative method of assessment would be an examination of how an article is employed when it is cited Through the examination of substantive contribution, marketing as a field could move toward evaluating research more effectively, rather than simply counting a specified number of publications or citations

Fourth, this study is limited by its temporal exposition Specifically, our analysis was conducted at a time when the field's leading journals are in a state of transition For example, in 2006, *MKS* became the first leading marketing journal to move beyond four issues per year This move was shortly followed by *JM* and *JMR* (in 2008) Thus, although our analysis helps provide data pertaining to the specified research questions from historical data, it is unclear as to their direct applicability to an environment in which a greater number of issues of these journals are published (e g , Will institutions raise expectations for publications in the leading journals now that the leading journals are publishing more articles?)

Fifth, note that we selected a specific 25-year period and that the selection of any other period (even simply shifting from 1982–2006 to 1983–2007) would result in different findings because the productivity of any single author varies according to his or her individual research cycles and publication dates Another period could identify a unique set of authors from those identified in this study

In conclusion, the purpose of this study was to examine the following questions (1) What level of publication productivity in the leading marketing journals does it take to get promoted in marketing academia? (2) What level of publication productivity in the leading marketing journals warrants exception? and (3) What drives research productivity in the leading marketing journals? Employing the economic concept of imperfect substitution and relying on insights from the field of scientometrics, we advanced the idea of promotion as a governance mechanism to work toward understanding these three publication-related research questions We believe that the findings provide new insights that are important to the development of the field Furthermore, we believe that the findings ask marketing faculty to question the stewardship role regarding the marketing discipline

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Ashwin W. Joshi

Continuous Supplier Performance Improvement: Effects of Collaborative Communication and Control

Manufacturing firms seek continuous supplier performance improvement because this outcome makes them more competitive in downstream markets. Although manufacturing firms use a range of tools to effect continuous supplier performance improvement, the author focuses on two that are especially important—collaborative communication and control—and poses the following research questions: (1) How does collaborative communication foster continuous supplier performance improvement? and (2) What are the combined effects of collaborative communication and control? The results from a survey of 153 manufacturer–supplier dyads show that collaborative communication fosters continuous supplier performance improvement by enhancing supplier knowledge (of manufacturer needs) and by building supplier affective commitment (toward the manufacturer). With respect to the combined effects of communication and control, the results show that capability control enhances the positive effects of both supplier knowledge and supplier affective commitment on continuous supplier performance improvement, whereas process control undermines the effect of supplier knowledge on the outcome. This pattern of results suggests that manufacturing firms should emphasize capability control and deemphasize process control to foster continuous supplier performance improvement.

Keywords: manufacturer–supplier relationships, collaborative communication, capability control, continuous improvement

Given that more than 50% of its total budget is allocated to procuring input components from suppliers (Krause, Handfield, and Scannell 1998, Tully 1995, Wagner 2006a), the typical manufacturing firm of today is more in the assembling business than in the business of actually producing the components required to create the end product. While improving the efficiency/effectiveness of the end product was solely in the manufacturer's purview in the past, the typical manufacturer of today depends on enhanced supplier performance to create better quality products (Lewis 1995). Consequently, enhancement of supplier performance on an ongoing basis has become a paramount objective for manufacturing firms because this enables them to gain and maintain competitive advantage in downstream markets. Enhancement of supplier performance on an ongoing basis (i.e., continuous supplier performance improvement) is the focus of this research.

In what is arguably the most comprehensive discussion to date of the drivers of supplier performance improvement, Krause, Scannell, and Calantone (2000) draw from the resource-based view and from the literature on internalization/externalization to identify two types of supplier performance improvement strategies—externalized and internalized—with a range of specific activities discussed under each type. Externalized supplier improvement strategies "entail use of the external market to instigate supplier performance improvements" (p. 36) and include activities such as the use of competitive pressure, supplier assessment, and supplier incentives. In contrast, internalized supplier improvement strategies "represent a direct investment of the buying firm's resources in the supplier" (p. 36) and refer to the direct involvement of the buying firm in the supplier through activities such as supplier site visits to provide guidance on performance improvement and investment in supplier training and development. Consistent with the internalized strategy, subsequent research has also specifically focused on the role of collaborative communication (Prahinski and Benton 2004) as a means to enhance supplier performance. In addition to identifying drivers of supplier performance improvement, Krause, Scannell, and Calantone also discuss the interrelationships among these drivers and demonstrate that direct involvement mediates the impact of the externalized supplier improvement strategies on supplier performance improvement.

Although several supplier performance improvement strategies have been documented in prior research, two in particular—collaborative communication and control—

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have been the focus of extensive discussion and deliberation in both the operations management (Krause 1999, Krause, Handfield, and Scannell 1998, Krause, Scannell, and Calantone 2000, Prahinski and Benton 2004) and the marketing (Cannon and Perreault 1999, Wagner 2006a, b) academic literature streams as well as in the practitioner literature (Handfield et al 2000, Lewis 1995) Given these strategies' prominent role in fostering supplier performance improvement, the current research focuses particularly on these two drivers

Although prior research has documented the important role of both collaborative communication and control in fostering continuous supplier improvement, several gaps remain in extant knowledge regarding these drivers First, with respect to collaborative communication, whereas prior research has discussed both a cognitive (Flint, Woodruff, and Gardial 2002) and an affective (Prahinski and Benton 2004) basis for the relationship between collaborative communication and continuous supplier performance improvement, the cognitive basis has not been formalized in terms of a specific mediating construct, and the relative effects of these bases have not been examined Second, with respect to control, whereas elements of both output (i e , supplier incentives) and process (i e , supplier assessment) control have been identified in prior literature (see Krause, Scannell, and Calantone 2000) as indirect drivers of supplier performance improvement, a comprehensive conceptualization of these mechanisms, in terms of the full range of reinforcement techniques (i e , rewards and punishments) that are deployed within each control mechanism, does not seem to exist in extant literature Furthermore, capability control, which has been shown in other contexts (see Challagalla and Shervani 1996) to be a significant alternative mode of control to output and process controls, has not been examined in the context of manufacturer attempts to improve supplier performance Finally, although it is understood that collaborative communication and control mechanisms coexist, the exact nature of their interrelationship has not been explored Thus, little is known about how the three control mechanisms work in tandem with collaborative communication to enhance supplier performance

The following research objectives are distilled on the basis of the preceding discussion

- To establish cognitive and affective mediating variables between collaborative communication and continuous supplier performance improvement and
- To identify the moderating effects of output, process, and capability control on the effects of these mediating variables

The proposed contributions to extant knowledge on continuous supplier performance improvement are as follows First, a more comprehensive explanation is provided for how collaborative communication affects continuous supplier performance improvement than is available in extant research Second, more theoretically comprehensive measures are developed for output and process control mechanisms than are available in extant research, and the notion of capability control is introduced into the manufacturer–supplier literature Finally, the interrelated effects of these control types with collaborative control on continuous supplier performance improvement are discussed in detail From a managerial perspective, this research offers concrete suggestions in terms of the control mechanisms that manufacturing firms should deploy and avoid in combination with collaborative communication to foster continuous supplier performance improvement

This study begins by developing the theoretical background for the conceptual model Subsequently, the methods adopted to test this model are outlined Following the presentation of the survey results, the article closes with a discussion of the theoretical, managerial, and research implications of the findings

Conceptual Framework

Background

Control theory Parties in an exchange make commitments to each other in terms of the actions that each will undertake to achieve mutual goals The role of control in exchange relationships is to ensure that the promised actions are indeed undertaken and to ascertain that the relationship is moving closer to achieving its desired goals (Jaworski 1988, Jaworski and MacInnis 1989) Prior research has identified two dimensions of control—information and reinforcement—with the former referring to activities such as goal setting, monitoring, and feedback and the latter referring to activities such as the administration of rewards/punishments (for an extensive review of this distinction, see Challagalla and Shervani 1996)

It is argued here that collaborative communication is the key mechanism by which the information dimension of control is exerted within exchange relationships and that there are three control mechanisms—output, process, and capability—through which the reinforcement dimension of control is exerted within exchange relationships Accordingly, each of these constructs is elaborated on in the subsequent discussion

Collaborative communication In line with the pioneering conceptual (Mohr and Nevin 1990) and empirical (Mohr, Fisher, and Nevin 1996) work by Mohr and colleagues, collaborative communication is defined in terms of four facets Communication between exchange partners is said to be collaborative when it is characterized by (1) high-frequency—that is, when there is a substantial amount of information sharing, (2) high formality—that is, when there are routinized interactions, (3) high reciprocal feedback, and (4) use of rationality as a means of attaining influence Thus, in the specific context of manufacturer–supplier relationships, collaborative communication is defined as the extent to which manufacturers communicate with their suppliers on a frequent, formal, and reciprocal basis while using rationality as a means by which to influence them

Although this discussion of collaborative communication draws extensively from Mohr and colleagues' (e g , Mohr, Fisher, and Nevin 1996, Mohr and Nevin 1990) work, it also differs from and extends it in two important ways First, whereas Mohr and colleagues identify bidirectionality—which they define in terms of the trajectory of information flow from Party A to Party B, and vice versa (Mohr, Fisher, and Nevin 1996, p 105)—as a key facet of collaborative communication, the current research refers instead to reciprocal feedback The essential distinction between bidirectionality and reciprocal feedback in this study is that whereas the former may include instances in which exchange parties "talk past" each other, the latter more specifically focuses on communication in which each party builds on what its partner has said Consistent with more recent research on collaborative communication (e g , Fisher, Maltz, and Jaworski 1997, Peters and Fletcher 2004), reciprocal feedback more accurately captures the intent of collaborative communication than bidirectionality, and accordingly, it is included as a key facet of the collaborative communication construct in place of bidirectionality

Second, whereas Mohr, Fisher, and Nevin (1996, p 105) define collaborative communication in terms of "noncoercive information sharing" between exchange partners, recent developments in the literature on noncoercive influences strategies suggest that rationality, which is defined in terms of providing rationale and evidence for why an exchange partner should adopt a particular recommendation (Payan and McFarland 2005), is an especially effective noncoercive means of gaining compliance Accordingly, this latest advance in the literature is incorporated here by replacing noncoercive information sharing with rationality as a key facet of the collaborative communication construct

Output, process, and capability control mechanisms In line with prior research by Challagalla and Shervani (1996), three types of control mechanisms are distinguished—output, process, and capability A manufacturer deploys output control over its supplier when it provides rewards to the supplier (e g , increases the supplier's share of business) for meeting/exceeding predetermined performance targets Conversely, output control is also in effect when the manufacturer administers punishments to the supplier (e g , by reducing the supplier's share of business) in response to a failure by the supplier to meet these targets Relatedly, a manufacturer deploys process control over its supplier when it administers rewards (punishments) to the supplier according to the supplier's conformance (nonconformance) to manufacturer expectations with regard to the production/operation processes used to fulfill the manufacturer's order Finally, capability control in the manufacturer–supplier relationship exists when the manufacturer focuses on the supplier's underlying ability to set up best-practice processes across the organization (in both operational and nonoperational domains) that standardize and routinize the transformation of inputs into outputs as the key basis for rewarding or punishing the supplier

Hypotheses

Definition of continuous supplier performance improvement Continuous supplier performance improvement refers to the trajectory of the supplier's track record in terms of meeting customer (i e , manufacturer) expectations on a range of performance metrics (Cannon and Perreault 1999) If the supplier's performance in terms of meeting these metrics shows an upward trend over time, the supplier exhibits continuous improvement

Now that the dependent variable in the conceptual model has been defined, the following subsections develop the research hypotheses First, the case is made for supplier knowledge as a mediator between collaborative communication and supplier performance Second, the hypotheses are developed for the mediating role of supplier affective commitment in the collaborative communication–supplier performance relationship Finally, the moderating effects of output, process, and capability controls on the mediating effects of both supplier knowledge and supplier affective commitment are examined Figure 1 provides a pictorial representation of the hypotheses

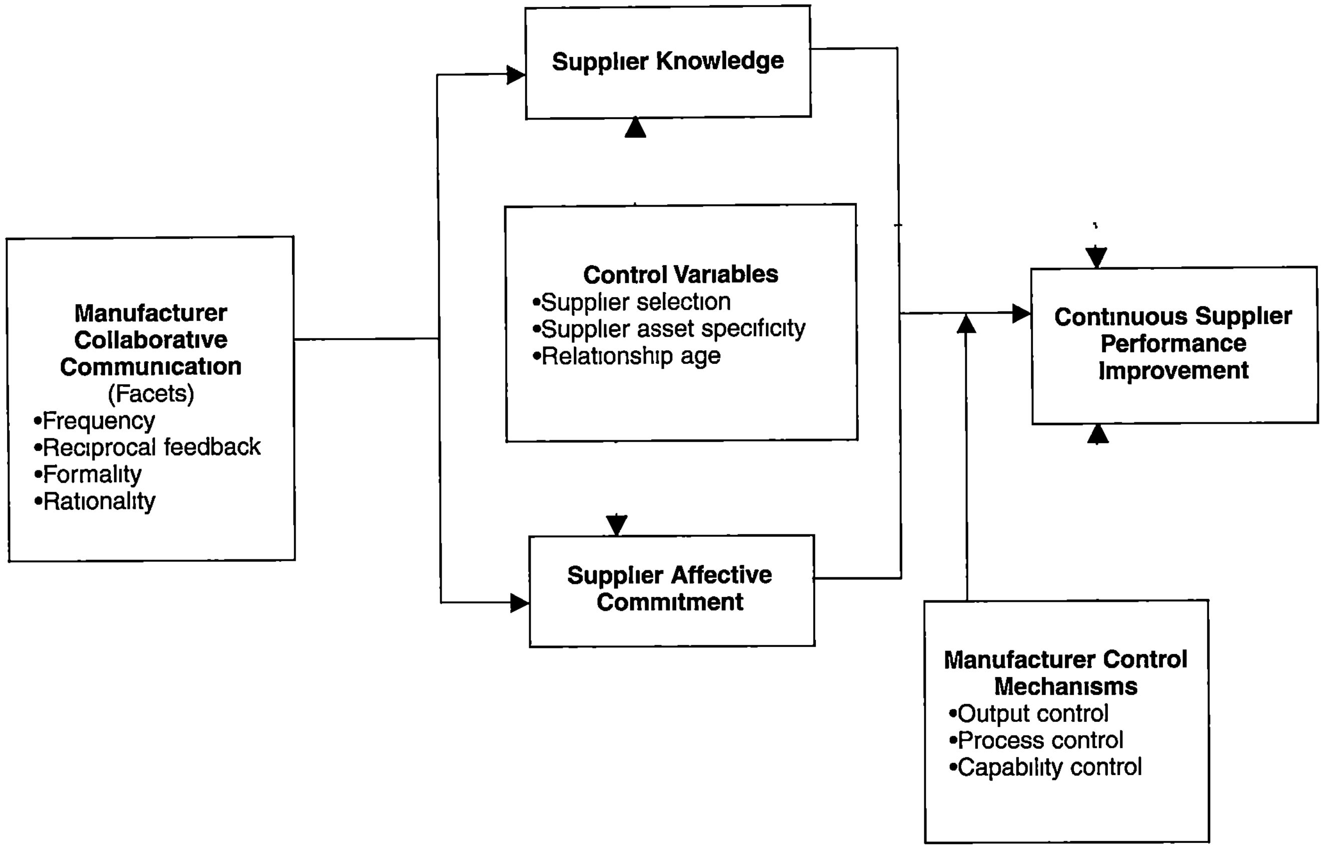
Effect of collaborative communication on continuous supplier performance improvement the mediating role of supplier knowledge Supplier knowledge refers to the extent to which the supplier has a "clear understanding" (Gwinner et al 2005, p 135) of the manufacturer's needs and expectations To the extent that the supplier is confident in its understanding of what the customer (i e , the manufacturer) wants, the supplier is considered knowledgeable

It is argued that collaborative communication in the manufacturer–supplier relationship enhances supplier knowledge, which in turn is positively related to continuous supplier performance improvement In short, supplier knowledge mediates the relationship between collaborative communication and supplier continuous performance improvement

To remain competitive in their downstream markets, manufacturing firms must continually raise the bar in terms of supplier performance expectations For suppliers, then, the implication is that they must continually improve their performance levels if they are to survive and prosper over the long run To improve their performance in a timely manner, however, suppliers need to be able either to accurately anticipate the desired value change of their customers (i e , the manufacturing firms) before it occurs or to recognize this desired value change as soon as it manifests Both approaches to managing customer-desired value change require the supplier to have a comprehensive understanding of the customer (i e , the manufacturer), which suggests that supplier knowledge drives continuous supplier performance improvement Based on extensive fieldwork of manufacturer–supplier relationships in automobile manufacturing supply chains in the United States, Flint, Woodruff, and Gardial's (2002) seminal study on customer-desired value change provides empirical support for these arguments Similarly, in a study of role stress in horizontal alliances, Nygaard and Dahlstrom (2002) find that the experience of role ambiguity among managers of horizontal alliances reduced their contribution to sales Consistent with the previous arguments, Nygaard and Dahlstrom contend (p 66), "As role responsibilities become less clear, retail managers must dedicate more cognitive resources to identify role expectations Because cognitive resource are limited, resources allocated to clarifying responsibilities cannot be dedicated to pragmatic, goal-based action"

By establishing an ongoing and reciprocal pattern of communication with their suppliers, manufacturing firms can convey their evolving expectations to suppliers and also provide them with timely performance feedback to align supplier performance with manufacturer expectations at any given point in time (Krause, Scannell, and Calantone 2000) Thus, by giving suppliers the opportunity to test and retest

FIGURE 1
Effects of Manufacturer Collaborative Communication and Control on Continuous Supplier Performance Improvement: A Conceptual Model



Notes: The dotted arrows refer to relationships that are estimated but not hypothesized.

their understanding of manufacturer expectations, manufacturer collaborative communication is expected to enhance supplier knowledge of evolving manufacturer expectations (which, as discussed previously, fosters continuous supplier performance improvement). Consistent with these arguments, Flint, Woodruff, and Gardial (2002, p. 112) identify "coordination"—which they describe in terms of "ensuring that the appropriate supplier representatives, such as sales representatives and engineers, [are] interacting with the appropriate people (within the manufacturer's organization)"—as being key to ensuring that the supplier develops a timely and comprehensive understanding of "new customer desires." Relatedly, Nygaard and Dahlstrom (2002) identify personal modes of communication between alliance partners as being key to reducing role ambiguity and role conflict. Collectively, these studies provide an empirical basis for the assertion that through collaborative communication, the manufacturer can ensure that the supplier becomes knowledgeable of the manufacturer's evolving expectations on an ongoing basis, thus fostering supplier continuous performance improvement.

On the basis of the preceding discussion, the following hypothesis is offered for empirical testing:

H_1: Supplier knowledge mediates the relationship between collaborative communication and continuous supplier performance improvement such that (a) collaborative communication is positively related to supplier knowledge and (b) supplier knowledge is positively related to continuous supplier performance improvement.

Effect of collaborative communication on continuous supplier performance improvement: the mediating role of supplier affective commitment. Affective commitment has been examined within marketing exchange relationships in prior research (e.g., Gundlach, Achrol, and Mentzer 1995; Kim and Frazier 1997a; Morgan and Hunt 1994) and exists when one party in the relationship feels a sense of "unity or cohesion" (Kim and Frazier 1997a, p. 143) with its partner. Thus, the current research context defines supplier affective commitment as the extent to which the supplier experiences a "high level of unity" (Kim and Frazier 1997a, p. 143) or, more generally, feels a "positive emotional attachment" (Gruen, Summers, and Acito 2000, p. 37) to the manufacturer.

It is argued that collaborative communication in the manufacturer–supplier relationship enhances supplier affective commitment toward the manufacturer, which in turn is positively related to continuous supplier performance improvement. In short, supplier affective commitment mediates the relationship between collaborative communication and continuous supplier performance improvement.

As many of the leading scholars in the affective commitment literature have observed (Allen and Meyer 1990, Mowday, Porter, and Steers 1982), when a source (e g , the supplier) experiences affective commitment toward a target (e g , the manufacturer), it becomes willing to expend energy and resources to foster the target's well-being (Gruen, Summers, and Acito 2000) Consistent with this argument, Prahinski and Benton (2004) find that supplier commitment to an industrial buying firm increased the supplier's performance in relation to the buying firm Relatedly, prior empirical research on marketing exchange relationships has shown that the sense of affective commitment experienced by one party in an exchange relationship reduces opportunism toward its partner (Gundlach, Achrol, and Mentzer 1995) while enhancing party cooperation with the partner (Morgan and Hunt 1994) and partner perception of party performance (Jap and Ganesan 2000) In addition, the argument that affective commitment by a source toward a target increases protarget behaviors by the source has also been validated extensively within the context of employee–organization relationships in both the organizational behavior (Dutton, Dukerich, and Harquail 1994, Mael and Ashforth 1992) and the marketing (Ahearne, Bhattacharya, and Gruen 2005, Gruen, Summers, and Acito 2000) literature streams

With respect to the drivers of affective commitment, prior empirical research on marketing exchange relationships has made a strong case for the role of collaborative communication as a key driver either directly (Mohr, Fisher, and Nevin 1996) or indirectly through its impact on trustworthiness (Kim and Frazier 1997b), the conceptual argument being that through frequent bilateral engagement, collaborative communication creates a sense of community between the exchange partners, giving rise to affective commitment (see also Prahinski and Benton 2004)

Taken together, the foregoing arguments suggest that supplier affective commitment mediates the effects of collaborative communication on continuous supplier performance improvement Accordingly, the following hypothesis is submitted for empirical testing

> H_2 Supplier affective commitment mediates the relationship between collaborative communication and continuous supplier performance improvement such that (a) collaborative communication is positively related to supplier affective commitment and (b) supplier affective commitment is positively related to continuous supplier performance improvement

Moderating effects of output, process, and capability control on supplier knowledge continuous supplier performance improvement relationship As noted previously, knowledge of the manufacturer's evolving preferences gives the supplier clear performance targets at any point in time, thus facilitating continuous improvement in supplier performance (Flint, Woodruff, and Gardial 2002) However, note that responsiveness to evolving manufacturer preferences may require the supplier to make changes to its products and operational processes These changes impose a cost burden that the supplier may be unable and/or unwilling to bear Because it creates (dis)incentives for (non)responsiveness, the use of output control by the manufacturer is expected to alleviate the cost burden of responsiveness and to increase the cost burden of nonresponsiveness, thus enhancing supplier willingness to become responsive to knowledge of the manufacturer's evolving preferences

In their study of the strategies used by manufacturing firms to improve supplier performance, Krause, Scannell, and Calantone (2000) find that supplier incentives, which they define as tools that are "designed to induce suppliers to improve their performance based on a desire for increased business with the firm" (p 36), are key enablers of supplier development Consistent with this argument, a key finding from their survey of a cross-section of industrial purchasing managers is that "supplier incentives motivate suppliers to improve by sending a message that improved performance is rewarded with increases in business and preferred status for future business" (p 49) Output control is an "indirect" supplier development strategy in that it generates the outcome (i e , supplier development) by working through the supplier (rather than working directly on the supplier) Several prior studies have shown that such indirect supplier development strategies have a positive impact on supplier performance (e g , Prahinski and Benton 2004, Wagner 2006a, b) On the basis of these studies, it is argued that when output control is high, suppliers receive incentives for investing in the requisite infrastructure upgrades that enable them to convert their knowledge of manufacturer preferences into concrete product outcomes Thus

> H_3 The positive relationship between supplier knowledge and continuous supplier performance improvement is enhanced when output control is high

In addition to the creation of requisite operational processes, conversion of the knowledge of evolving manufacturing preferences into concrete product outcomes also requires conformance to these operational processes As has been noted in the literature on total quality management in relation to the development of manufacturer–supplier relationships, presence of the appropriate operational infrastructure within the supplier is no guarantee that it will be used in conformance with manufacturer expectations, because the supplier may lack the necessary discipline to ensure that its operational processes never deviate from manufacturer expectations (Forker 1997, see also Forker and Hershauer 2000, Forker, Ruch, and Hershauer 1999) Establishing process control over the supplier is a means by which the manufacturer can ensure that such deviation does not occur Thus, when manufacturer process control is high, it is expected that supplier conversion of knowledge of evolving manufacturer expectations into concrete outcomes is enhanced because the manufacturer is able to reduce deviations in the supplier's operational processes

Building on the empirical work by Forker (1997), several other studies also provide evidence for the general argument that assessment of supplier activities and processes is a key driver of supplier improvement (Krause, Scannell, and Calantone 2000, Prahinski and Benton 2004, Wagner 2006a, b) Collectively, these studies provide the empirical basis for the argument that process control enables suppliers to transform their knowledge of evolving manufacturer preferences into high-quality outcomes by ensuring conformance to predetermined operational processes. As with quality improvement, it is expected that, over time, process conformance improves overall levels of supplier efficiency/effectiveness (Ulaga and Eggert 2006). Accordingly, the following hypothesis is submitted for empirical testing:

> H_4: The positive relationship between supplier knowledge and continuous supplier performance improvement is enhanced when process control is high.

Although suppliers may invest in the appropriate operational infrastructure and conform to the manufacturer's process expectations, because the manufacturer's outcome expectations are continually evolving (Flint, Woodruff, and Gardial 2002), the supplier needs to ensure that it simultaneously conforms to the manufacturer's current expectations and works toward evolving its operational processes so that the subsequent outputs meet the manufacturer's evolved future expectations. To achieve this process adaptability, suppliers need process "capability"—that is, the underlying knowledge regarding the construction of resource mobilizing routines (Day 1999; Hagel and Brown 2005; Hunt and Morgan 1995; Ray and Ramakrishnan 2006; Winter 2000) that enable the supplier to evolve its operational processes in a timely manner.

Although the development of capabilities (i.e., the creation of dynamic capabilities) is essential for sustainable competitive advantage (Teece 2007; Teece, Pisano, and Shuen 1997), it entails the commitment of organizational resources in terms of managerial cognitive effort and time. Given the long-term nature of the payoffs associated with capability development, suppliers may be reluctant to invest resources to this end, preferring instead to commit resources to addressing more immediately pressing issues. By providing incentives to suppliers to engage in this activity, manufacturer capability control encourages suppliers to focus on the development of their routine building capability (Teece, Pisano, and Shuen 1997). Thus, when manufacturer capability control is high, it is expected that supplier conversion of the knowledge of evolving manufacturer expectations into outcomes is enhanced because suppliers are able to adapt their processes to remain aligned with evolving customer preferences.

The supplier development literature (Handfield et al. 2000; Humphries, Li, and Chan 2004; Krause, Scannell, and Calantone 2000; Sako 2004) provides both in-depth case study and cross-sectional survey evidence for the impact of the deployment of capability control by the manufacturer on the improvement of supplier performance on a sustained basis. Accordingly, it is expect that when manufacturer capability control is high, supplier ability to evolve operational routines is finely honed because the supplier is able to translate its knowledge of evolving manufacturer expectations effectively and efficiently into concrete outcomes. Thus:

> H_5: The positive relationship between supplier knowledge and continuous supplier performance improvement is enhanced when capability control is high.

Moderating effects of output, process, and capability control on the supplier affective commitment–continuous supplier performance improvement relationship. As discussed previously, a supplier's affective commitment toward a manufacturer motivates the supplier to engage in activities that increase the probability of extending its relationship with the manufacturer. Thus, given that the manufacturer requires continuous supplier performance improvement to continue its relationship with the supplier, it is expected that the supplier will work toward ensuring this outcome. In this section, the position is taken that manufacturer deployment of output, process, and capability control enhances the effect of supplier affective commitment on continuous supplier performance improvement.

Although supplier affective commitment motivates supplier performance, it is contended that motivation alone may be insufficient to produce the desired outcome. Indeed, (1) absence of the appropriate process infrastructure, (2) the lack of conformance to operational processes, and (3) the lack of ability to evolve these processes to remain aligned with evolving manufacturer preferences all represent critical impediments to the effect of supplier affective commitment on supplier continuous performance improvement. In line with the same bodies of knowledge cited previously, it is argued that manufacturer output control enables suppliers to create the appropriate process infrastructure, manufacturer process control ensures supplier conformance to operational processes, and manufacturer capability control facilitates supplier evolution of these operational processes. Thus, by aligning supplier motivation with the ability to overcome the previously described impediments, it is expected that each of the control types enhances the effect of supplier affective commitment on the outcome.

In line with the preceding arguments, the following hypotheses are submitted for empirical testing:

> H_6: The positive relationship between supplier affective commitment and continuous supplier performance improvement is enhanced when output control is high.
>
> H_7: The positive relationship between supplier affective commitment and continuous supplier performance improvement is enhanced when process control is high.
>
> H_8: The positive relationship between supplier affective commitment and continuous supplier performance improvement is enhanced when capability control is high.

Controls

Although the prime contention here is that collaborative communication is a key driver of supplier knowledge and supplier affective commitment, with continuous supplier performance improvement being the resultant outcome, the review of prior literature also indicates that other factors have an important influence on the mediating and outcome variables in the conceptual model. Thus, for example, supplier selection based on operational and marketing competence can affect both supplier knowledge and the outcome (Hsu et al. 2006; Krause, Scannel, and Calantone 2000). Similarly, specific supplier adaptations may be highly correlated with supplier affective commitment and the outcome (Prahinski and Benton 2004). Finally, apart from collaborative communication, the mediators and the outcome variables may simply be a function of the age of the relationship (see Prahinski and Benton 2004, p. 47). Thus, the effects of supplier selection, supplier-specific adaptations, and relationship age are control for in the assessment of the effect of collaborative communication on continuous supplier performance improvement

Method

Research Context, Design, and Administration

The research hypotheses are examined in the context of manufacturer–supplier relationships for the following Standard Industrial Classification codes 35 (industrial machinery and equipment), 36 (electronic and other electrical equipment), and 37 (transportation equipment) These industries were chosen for two reasons (1) because of the prevalence of joint action within manufacturer–supplier relationships in these industries and (2) because control over supplier operations is a key concern for manufacturers in these industries (Heide and John 1990, Joshi and Stump 1999)

A cross-sectional, survey-based research design was used to test the conceptual model A list of 761 firms in Canada within these Standard Industrial Classification codes was obtained from Dun & Bradstreet, each of these firms was telephoned to establish contact with a manager (e g , vice president of sales and marketing) who was knowledgeable about the survey issues and willing to participate Key informants were asked to focus on a "customer" relationship, with the customer in question being a manufacturer that incorporated the product created by the informant's firm into its own product that was then sold to downstream markets Furthermore, each informant was asked to focus on a customer relationship (1) that was important to his or her firm (Stump and Heide 1996), (2) that had existed for more than two years, and (3) that the informant or his or her direct report had personally managed for at least one year (Kumar, Stern, and Anderson 1993) In addition, each key informant was asked to provide the name of a contact at his or her customer's organization for the collection of validation data In return for their assistance in completing the survey, informants were promised a copy of the ensuing research report and an invitation to a seminar on the management of manufacturer–supplier relationships

A total of 363 questionnaires were mailed to the managers who indicated interest in participating in the survey Two weeks after this mailing, reminder postcards were sent Four weeks after the initial mailing, 185 completed questionnaires were received, at which point the survey was closed The response rate was 24 3% from the original sample and 50 9% from those who agreed to participate Telephone interviews were conducted with the contacts in customer organizations that were provided by the key informants After three callbacks and the provision of incentives for participation, data from 153 customer contacts were collected (for a response rate of 82 7%) Thus, the sections that follow report the results obtained from 153 supplier–manufacturer dyads

Measures

Measure development and pretest Measure development entailed creating items to map the domain of each construct in the model (Churchill 1979), which was done either by modifying items from existing scales or by examining insights gleaned from field interviews A qualitative pretest of the questionnaire was conducted through interviews with two academics who were familiar with the research issues and with five purchasing agents On the basis of these interviews, several items were revised for clarity, and others were eliminated because they were considered redundant In addition, new items were created to measure constructs that were not comprehensively measured by the existing items Next, the questionnaire was again pretested with a convenience sample (n = 43) of senior (e g , directors, vice presidents) industrial sales/marketing managers and their customer contacts Responses from this pretest led to further item modifications

Collaborative communication Consistent with prior research (Mohr, Fisher, and Nevin 1996), collaborative communication was conceptualized as a second-order construct with four first-order dimensions In many cases, previously validated scales were used to measure each of these dimensions Consistent with prior studies (Mohr, Fisher, and Nevin 1996), frequency was measured across three domains—face-to-face communication, telephone communication, and written communication—with each domain being measured by three items to create a nine-item scale Reciprocal feedback was measured with a six-item scale from the work of Fisher, Maltz, and Jaworski (1997) As discussed previously, the concept of reciprocal feedback was used instead of bidirectionality because the former makes it possible to distinguish between communication patterns in which parties "talk with" rather than "talk past" each other Mohr, Fisher, and Nevin's (1996) work was used, rather than more recent research (e g , Johlke et al 2000), for the six-item measure of formality because this scale explicitly captures the routinization of communication and does not confound it with the vehicle (i e , oral versus written) of communication Finally, the three-item measure of noncoercive communication was based on Payan and McFarland's (2005) recent research, rather than Mohr, Fisher, and Nevin's measure, because the former offers a more fine-grained understanding of the means by which noncoercive influence is achieved [1]

Supplier knowledge Supplier knowledge—that is, clarity of the supplier's understanding of its customer's needs—was measured with a five-item scale adapted from the services literature (Gwinner et al 2005) Although there is research on the development of customer knowledge in the market orientation literature (e g , Jayachandran, Hewitt, and Kaufman 2004), it focuses mainly on the process of knowledge development rather than the extent of knowledge that is accumulated The chosen measure best reflects the extent of knowledge that has been developed

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[1] Note that data were also collected on all the collaborative communication subscales developed by Mohr, Fisher, and Nevin (1996) However, only subscales that are consistent with the revised conceptualization of the collaborative communication construct are reported The results from using the original collaborative communication scale are entirely consistent with the results reported subsequently

Supplier affective commitment This construct refers to the sense of belonging that is experienced by the supplier in relation to the manufacturer Prior research (Anderson and Weitz 1992, Kim and Frazier 1997a, Mael and Ashforth 1992) was used to develop a six-item measure of this construct

Output, process, and capability controls Output control (i e , regulation of the supplier by rewarding [punishing] it for meeting [failing to meet] preset targets), process control (i e , regulation of the supplier by rewarding [punishing] it for undertaking [failing to undertake] particular behaviors), and capability control (i e , regulation of the supplier by rewarding [punishing] it for the development [lack of development] of the dynamic capabilities necessary to meet the manufacturer's evolving expectations) were measured with scales from prior research by Challagalla and Shervani (1996)

Continuous supplier performance improvement The supplier performance metrics of interest to manufacturers were identified from prior research by Cannon and Perreault (1999) Based on their work, an eight-item scale that captures the trajectory of the supplier's performance over time on the metrics that matter to manufacturers was developed

Controls Supplier selection—that is, the extent to which manufacturers assessed suppliers on technological and marketing expertise before establishing a contract with the supplier—was measured with a three-item scale that developed from field interviews A five-item scale that had been previously validated (Cannon and Perreault 1999) was used to measure adaptations made by the supplier to suit the needs of the focal manufacturer Finally, age of relationship was measured with a single indicator that captured the length of time since the initial establishment of the focal relationship (i e , the relationship with the manufacturer)

Results

Measure Validation

The measures were validated by following Churchill's (1979) and Gerbing and Anderson's (1988) recommended procedures After the item-to-total correlations were examined and the items were submitted to an exploratory factor analysis, those with low correlations and those that exhibited significant cross-loadings were eliminated In terms of confirmatory factor analysis (CFA), given that the data set does not meet the five-observations-per-indicator threshold (Hair et al 1995), it was not possible to perform a global CFA of the measures Instead, the following CFA models were estimated separately Model 1 examined the second-order conceptualization of the collaborative communication construct, Model 2 examined the factor structure of the two mediating constructs (i e , supplier knowledge and supplier affective commitment) and the outcome construct (i e , supplier continuous performance improvement), and Model 3 examined the factor structure of the three moderator constructs (i e , outcome control, process control, and capability control)

Model 1 was estimated as a second-order factor (i e , collaborative communication) with four first-order dimensions (i e , frequency, reciprocal feedback, formality, and rationality) The results (χ^2 = 411 24, d f = 248, $p <$ 01, average off-diagonal squared residual [AOSR] = 04, comparative fit index [CFI] = 97) indicate a good fit with the data Furthermore, all the first-order and second-order item loadings were statistically significant (for details, see the Appendix) On the basis of these results, it was concluded that the measures for collaborative communication demonstrate convergent validity The results for Model 2 also support the proposed three-factor structure (i e , supplier knowledge, supplier affective commitment, and continuous supplier performance improvement) (χ^2 = 272 13, d f = 153, $p <$ 01, AOSR = 03, CFI = 98) The statistically significant item loadings (see the Appendix) provide additional evidence for the convergent validity of these measures To assess discriminant validity, the "free" CFA model (i e , the correlations among constructs are freely estimated) was compared with a series of constrained models (i e , the correlation between each pair of constructs in the free model is sequentially and independently constrained to unity) In all instances, the fit of the constrained model is poorer than that of the free model (lowest χ^2 difference = 15 73, d f = 1, $p <$ 01) This pattern of results provides confirmatory evidence of the discriminant validity of these measures

The procedures used to test Model 2 were replicated to confirm Model 3 The results for the free model (χ^2 = 321 06, d f = 171, $p <$ 01, AOSR = 04, CFI = 96) and the statistically significant factor loadings provide evidence for the convergent validity of these measures Again, model fit of all the constrained models was appreciably poorer than that of the free model (lowest χ^2 difference = 29 02, d f = 1, $p <$ 01), thus providing evidence for the discriminant validity of these measures

Construct reliability (Hair et al 1995) constitutes another facet of the evidence necessary to substantiate measure validity The reliability of each of the eight multi-item reflective scales exceeded the 70 benchmark (Nunnally 1978) for the establishment of construct validity (for details, see Table 1)

Testing for Key Informant Knowledgeability, Common Method Bias, and Nonresponse Bias

Survey research is vulnerable to three problems in particular First, given that survey research relies on data from key informants, the assumption is that the key informants are knowledgeable about the issues contained in the survey To the extent that they are not knowledgeable, the validity of the data is compromised This research tested for the knowledgeability of the key informants (senior marketing/sales managers in the supplier sample and their key contacts in the manufacturer sample) in three ways (1) through prescreening telephone interviews in which informants were asked about their knowledgeability about survey issues, (2) by requiring them to report on a manufacturer relationship they had been closely involved with for a minimum period of two years, and (3) by asking them to self-report on their level of knowledgeability in the final survey ("How knowledgeable are you on the issues covered in this survey?" 1 = "not at all," and 5 = "highly", $M_{supplier}$ = 4 6, $M_{manufacturer}$ = 4 8) Collectively, these procedures and results provide con-

TABLE 1
Correlations and Descriptive Statistics (n = 153)

Variables	1	2	3	4	5	6	7	8	9	10
1 Supplier selection	1 00									
2 Supplier adaptation	12*	1 00								
3 Relationship age	05	16*	1 00							
4 Collaborative communication	21*	23*	13*	1 00						
5 Supplier knowledge	04	03	16**	26**	1 00					
6 Supplier affective commitment	11*	09	21**	28**	09	1 00				
7 Output control	01	07	02	09	01	02	1 00			
8 Process control	04	02	07	11*	04	05	– 07	1 00		
9 Capability control	09	08	15*	13*	07	09	– 16*	18*	1 00	
10 Continuous supplier performance improvement	11*	21*	03	21*	45**	37**	19*	04	38**	1 00
M	3 31	3 61	3 18	3 12	3 85	3 21	2 87	3 99	3 67	3 76
SD	79	1 01	1 33	1 61	1 82	1 02	1 26	73	1 21	1 53
Construct reliability	93	87	N A	81	79	86	84	79	77	81

*$p < 05$ (one-tailed)
**$p < 01$ (one-tailed)
Notes N A = not applicable

fidence that the data come from knowledgeable informants (John and Reve 1982, Kumar, Stern, and Anderson 1993)

Second, common method bias occurs because measures of both the independent and the dependent variables are collected within the same instrument, thus leading to an artificial inflation of the correlation between them In this research, the threat of common method bias was contained through the use of separate key informants for the independent (senior sales/marketing managers in supplier organizations) and dependent (senior purchasing managers in manufacturing organizations) constructs (Podsakoff et al 2003, p 887)

Third, nonresponse bias (Armstrong and Overton 1977) was assessed by comparing early and late respondents and respondents and nonrespondents in terms of company sales volume and number of employees Furthermore, early and late respondents were compared with regard to the substantive constructs in the model There were no statistically significant differences in these comparisons, thus, nonresponse bias does not seem to be a concern in this study On the basis of the preceding discussion, it is concluded that the measures used to test the conceptual model are valid and that the quality of the data is high

Hypothesis Testing

H_1 predicts that supplier knowledge mediates the relationship between collaborative communication and continuous supplier performance improvement Baron and Kenny's (1986, p 1177) three-step procedure was followed to test this hypothesis (see Table 2) In Step 1, the effects of the control variables and collaborative communication on supplier knowledge were assessed In Step 2, the effects of the controls and collaborative communication on continuous supplier performance improvement were assessed Finally, in Step 3, the effects of the controls, collaborative commu-

TABLE 2
Mediating Effect of Supplier Knowledge on the Relationship Between Collaborative Communication and Continuous Supplier Performance Improvement (Test of H_1)

Independent Variables	Step 1: Dependent Variable = Supplier Knowledge	Step 2: Dependent Variable = Continuous Supplier Performance Improvement	Step 3: Dependent Variable = Continuous Supplier Performance Improvement
Supplier selection	01 (t = 05, p = n s)	14 (t = 1 71, $p <$ 05)	12 (t = 1 39, $p <$ 10)
Supplier adaptation	– 02 (t = – 16, p = n s)	20 (t = 2 79, $p <$ 001)	15 (t = 1 99, $p <$ 01)
Age	18 (t = 2 51, $p <$ 001)	– 05 (t = – 25, p = n s)	– 05 (t = – 25, p = n s)
Collaborative communication	36 (t = 5 70, $p <$ 001)	27 (t = 4 18, $p <$ 001)	16 (t = 2 14, $p <$ 01)
Supplier knowledge			40 (t = 6 63, $p <$ 001)
Adjusted R^2	07	11	14

Notes Cells contain standardized beta (t-values and one-tailed p-value) n s = not significant nication, and supplier knowledge on continuous supplier performance improvement were assessed As Table 2 shows, the results from Step 1 indicate that the effect of collaborative communication on supplier knowledge is statistically significant (36, t = 5 70, $p <$ 001), that the effect of collaborative communication on continuous supplier performance improvement is significant in Step 2 (27, t = 4 18, $p <$ 001), and that the Step 2 effect is weaker in Step 3 (effect of collaborative communication on continuous supplier performance improvement = 16, t = 2 14, $p <$ 01) when supplier knowledge is incorporated as an independent variable in the regression model Collectively, this pattern of results provides support for H_1

The same procedures were followed to test for H_2, which hypothesizes a mediating effect of supplier affective commitment on the relationship between collaborative communication and continuous supplier performance improvement The results (see Table 3) show that, consistent with Baron and Kenny's (1986) requirements, collaborative communication has a significant effect on supplier affective commitment (Step 1) (31, t = 4 98, $p <$ 001) and on continuous supplier performance improvement (Step 2) (27, t = 4 18, $p <$ 001) and that the Step 2 effect is weaker in Step 3 when supplier affective commitment is incorporated into the model as an additional predictor of continuous supplier performance improvement (15, t = 1 99, $p <$ 01) Thus, the results support H_2

In both these cases, the direct effect of collaborative communication on continuous supplier performance improvement remained significant in Step 3, though the strength of this relationship was weaker than it was in Step 2 Additional mediational analyses were performed in which supplier knowledge and supplier affective commitment were incorporated as simultaneous mediators of the collaborative communication–continuous supplier performance improvement relationship The results from this analysis show that the effect of collaborative communication on continuous supplier performance improvement was not significant in Step 3 relative to Step 2 These results provide evidence to suggest that, collectively, supplier affective commitment and supplier knowledge are complete mediators of the collaborative communication–continuous supplier performance improvement relationship (see Table 4)

H_3–H_8 were tested by regressing continuous supplier performance improvement on the control variables (supplier selection, supplier asset specificity, and relationship age), the independent variables (supplier knowledge, supplier affective commitment, output control, process control, and capability control), and the interaction terms (supplier knowledge × output control, supplier knowledge × process control, supplier knowledge × capability control, supplier affective commitment × output control, supplier affective commitment × process control, and supplier affective commitment × capability control) Given that this equation contains both main effects and constituent interaction terms, the potential for multicollinearity is high To address this concern, mean-centered data were used, the results show that none of the variance inflation factions were greater than 2, indicating a low probability of multicollinearity (Aiken and West 1991, Neter, Wasserman, and Kutner 1990)

Hierarchical moderated regression was used to test this equation, with the control variables being entered in Step 1, the independent variables being entered in Step 2, and the interaction terms being entered in Step 3 The results (see Table 5) show that the increase in explained variance from Step 2 to Step 3 is significant (change in $R^2 =$ 10, $p <$ 01), thus providing general support for the contention that the controls moderate the effects of supplier knowledge and supplier affective commitment on continuous supplier performance improvement Examination of the individual interaction effects shows that H_3 (i e , positive moderating effect of outcome control on the supplier knowledge–continuous supplier performance improvement relationship) (24, t = 3 67, $p <$ 001), H_5 (i e , positive moderating effect of capability control on the interaction supplier knowledge–continuous supplier performance improvement relationship) (20, t = 2 79, $p <$ 001), and H_8 (i e , positive moderating

TABLE 3
Mediating Effect of Supplier Affective Commitment on the Relationship Between Collaborative Communication and Continuous Supplier Performance Improvement (Test of H_2)

Independent Variables	Step 1: Dependent Variable = Supplier Affective Commitment	Step 2. Dependent Variable = Continuous Supplier Performance Improvement	Step 3: Dependent Variable = Continuous Supplier Performance Improvement
Supplier selection	12 (t = 1 39, $p <$ 10)	14 (t = 1 71, $p <$ 05)	12 (t = 1 39, $p <$ 10)
Supplier adaptation	07 (t = 1 18, p = n s)	20 (t = 2 79, $p <$ 001)	13 (t = 1 56, $p <$ 10)
Age	24 (t = 3 67, $p <$ 001)	– 05 (t = – 25, p = n s)	– 05 (t = – 25, p = n s)
Collaborative communication	31 (t = 4 98, $p <$ 001)	27 (t = 4 18, $p <$ 001)	15 (t = 1 99, $p <$ 01)
Supplier affective commitment			38 (t = 5 96, $p <$ 001)
Adjusted R^2	05	11	14

Notes Cells contain standardized beta (t-values and one-tailed p-value) n s = not significant

TABLE 4
Mediating Effect of Supplier Knowledge and Supplier Affective Commitment on the Relationship Between Collaborative Communication and Continuous Supplier Performance Improvement (Additional Results for H_1 and H_2)

Independent Variables	Step 1: Dependent Variable = Continuous Supplier Performance Improvement	Step 2: Dependent Variable = Continuous Supplier Performance Improvement	Step 3: Dependent Variable = Continuous Supplier Performance Improvement
Supplier selection	14 (t = 1 71, $p <$ 05)	12 (t = 1 39, $p <$ 10)	12 (t = 1 39, $p <$ 10)
Supplier adaptation	20 (t = 2 79, $p <$ 001)	15 (t = 1 99, $p <$ 01)	20 (t = 2 79, $p <$ 01)
Age	– 05 (t = – 25, p = n s)	– 05 (t = – 25, p = n s)	– 05 (t = – 25, p = n s)
Collaborative communication	27 (t = 4 18, $p <$ 001)	16 (t = 2 14, $p <$ 01)	11 (t = 1 26, $p <$ 10)
Supplier knowledge		40 (t = 6 63, $p <$ 001)	37 (t = 5 73, $p <$ 001)
Supplier affective commitment			32 (t = 5 01, $p <$ 001)
Adjusted R^2	11	14	16

Notes Cells contain standardized beta (t-values and one-tailed p-value) n s = not significant

TABLE 5
Continuous Supplier Performance Improvement: Effects of Supplier Knowledge, Supplier Affective Commitment, and Control Types (Test of H_3–H_8)

Independent Variables	Hypothesis	Model 1	Model 2	Model 3
Supplier selection		12 (t = 1 39, $p <$ 10)	11 (t = 1 26, p = n s)	07 (t = 1 18, p = n s)
Supplier adaptation		20 (t = 2 79, $p <$ 01)	17 (t = 2 29, $p <$ 05)	13 (t = 1 56, $p <$ 10)
Age		01 (t = 02, p = n s)	– 03 (t = – 13, p = n s)	– 03 (t = – 13, p = n s)
Supplier knowledge			37 (t = 5 73, $p <$ 001)	34 (t = 5 13, $p <$ 001)
Supplier affective commitment			32 (t = 5 01, $p <$ 001)	30 (t = 4 73, $p <$ 001)
Output control			17 (t = 2 29, $p <$ 05)	15 (t = 1 99, $p <$ 01)
Process control			– 06 (t = – 73, p = n s)	– 09 (t = –1 19, p = n s)
Capability control			34 (t = 5 13, $p <$ 001)	30 (t = 4 73, $p <$ 001)
Supplier knowledge × output control	H_3			24 (t = 3 67, $p <$ 001)
Supplier knowledge × process control	H_4			– 16 (t = –1 79, $p <$ 05)
Supplier knowledge × capability control	H_5			20 (t = 2 79, $p <$ 001)
Supplier affective commitment × output control	H_6			–03 (t = – 64, p = n s)
Supplier affective commitment × process control	H_7			09 (t = 1 20, p = n s)
Supplier affective commitment × capability control	H_8			36 (t = 5 70, $p <$ 001)
Adjusted R^2		04	13	23

Notes Cells include standardized beta (t-value and one-tailed p-value) For H_4, the result is opposite to the prediction n s = not significant

effect of capability control on the supplier affective commitment–continuous supplier performance improvement relationship) (36, t = 5 70, $p <$ 001) are all supported However, H_6 (i e , positive moderating effect of output control on the supplier affective commitment–continuous supplier performance improvement relationship) (– 03, t =

–.64, p = not significant [n.s.]) and H_7 (i.e., positive moderating effect of process control on the supplier affective commitment–continuous supplier performance improvement relationship) (.09, t = 1.20, p = n.s.) are not supported. Most intriguingly perhaps is the result for H_4 (i.e., positive moderating effect of process control on the supplier knowledge–continuous supplier performance improvement relationship) (–.16, t = –1.79, $p < .05$), which is opposite to the predicted direction.

Discussion

Given manufacturers' increasing reliance on suppliers for input components, continuous supplier performance improvement is an important outcome for manufacturing firms because it has a direct bearing on their competitiveness and performance in downstream markets. Prior research on supplier performance has emphasized two tools that manufacturers can use—collaborative communication (Mohr, Fisher, and Nevin 1996) and control (Krause 1999; Krause, Handfield, and Scannell 1998)—to foster continuous supplier performance improvement. The current research extends this body of prior knowledge in two ways. First, it empirically documents the theoretical pathways through which collaborative communication affects supplier performance. Second, it explores the combined effects of collaborative communication and control on continuous supplier performance improvement.

In line with prior literature, two pathways—one cognitive (through the supplier knowledge construct) and the other affective (through the supplier affective commitment construct)—that connect collaborative communication to continuous supplier performance improvement were identified. The results provide support for both processes while demonstrating that, collectively, they represent complete mediators of the relationship between collaborative communication and the outcome (see Table 4).

In terms of the combined effects of collaborative communication and control, it is argued that output, process, and capability control moderate the mediating effects of both supplier knowledge and supplier affective commitment, such that the effects of these mediating variables on continuous supplier performance improvement are enhanced (attenuated) at high (low) levels of each of these types of controls. The results show that the hypothesized relationship of complementarity between collaborative communication and control holds (1) entirely for the effects of capability control, (2) partially for the effects of output control, and (3) not at all for the effects of process control. The results further show that process control actually undermines the positive effect of supplier knowledge on continuous supplier performance improvement.

An explanation for the negative moderating effect of process control on the supplier knowledge–continuous supplier performance improvement relationship is that suppliers may be reacting to the constraints on their freedom that are imposed by process control by behaving opportunistically against the manufacturer. Consistent with this reactance theory–based argument (Brehm 1966), recent research has shown that opportunism by a partner firm increases in the face of increased behavior monitoring by the focal firm (see Heide, Wathne, and Rokkan 2007).

In addition to the findings as they pertain to the conceptual model, the results for capability control are especially noteworthy and warrant further discussion. Note that of the three types of control mechanisms examined, capability control has the strongest main effect on continuous supplier performance improvement and is the only control mechanism that is a statistically significant moderator of the effects of both supplier knowledge and supplier affective commitment on the outcome (see Table 5). The results from prior research examining capability control has shown that though its effect on immediate performance outcomes is nonsignificant, "capability control may pay off by improving performance in the long-term" (Challagalla and Shervani 1996, p. 100). By focusing on performance improvement over time, the current research both addresses Challagalla and Shervani's (1996, p. 100) call to "clarify the long-term effects of capability control" and provides support for their contention that capability control generates performance gains over the long run.

Theoretical Implications

Whereas cognitive and affective drivers of attitude/behavior have traditionally been examined independently and in distinct literature streams, there have been increasing attempts in recent years to examine the simultaneous effects of these drivers (Agarwal and Malhotra 2005; Malhotra 2005; Sierra and Hyman 2006). The results from the research pertaining to the simultaneous total mediating effects of supplier knowledge and supplier affective commitment speak to the importance of bridging these previously independent bodies of knowledge. As the results demonstrate, both supplier knowledge and supplier affective commitment provide valid, but partial, explanations for how collaborative communication in the supplier–manufacturer relationship fosters continuous supplier performance improvement. Collectively, however, they provide a complete explanation for the effect of collaborative communication on continuous supplier performance improvement.

The control literature distinguishes between two modes of control—informal and formal—with a key distinction being that whereas the latter can be imposed unilaterally, the former requires active bilateral participation between the party that is imposing the control (the manufacturer) and the party that is being controlled (the supplier) (Jaworski 1988). Although the distinction between these modes of control is widely understood and acknowledged in prior research, as is the notion that these modes coexist to create a combined impact on behavioral outcomes, there is no consensus as to the precise nature of this combined impact. For example, Brown, Dev, and Lee (2000) find limited empirical support for their contention that relational norms (an informal mode of control) enhance the effects of ownership (a formal mode of control) on reducing opportunism, thus suggesting a relationship of complementarity between these control modes. In contrast, the finding from Mohr, Fisher, and Nevin's (1996) study that control reduces the positive effect of collaborative communication on commitment, satisfaction, and coordination indicates that formal and informal control modes may indeed by substitutes

By unbundling the effect of collaborative communication on continuous supplier performance improvement in terms of both cognitive and affective processes and by examining the moderating effects of three distinct types of control mechanisms on these processes, this research offers a more nuanced study of the relationship between formal and informal control modes than is evidenced in prior research The research findings show that neither characterization—complements or substitutes—is universally accurate but that each is correct in a given set of circumstances The positive moderating effect of capability control on the effects of both supplier knowledge and supplier affective commitment shows that when capability control is employed, the complementarity thesis between formal and informal control modes prevails Conversely, as the negative moderating effect of process control on the effect of supplier knowledge suggests, the substitution thesis is potentially more relevant when process control is being used Thus, this research suggests that to understand the interrelationship between informal and formal control modes, it is important to specify the type of formal control mechanism that is under consideration as part of the formal model of control

Managerial Implications

Given that today's manufacturing firms rely extensively on external suppliers for input components, it is not surprising that prior research has identified the improvement of supplier performance as "one of the most critical strategic weapons" in the battle for competitive advantage (Krause, Scannell, and Calantone 2000, p 35) Developing collaborative communications with suppliers (Prahinski and Benton 2004) and establishing supplier control mechanisms, such as incentives and assessments (Krause, Scannell, and Calantone 2000), have already been identified in prior research as key action recommendations for manufacturing firms that want to improve supplier performance on an ongoing basis As noted previously, examination of the joint effects of collaborative communication with three distinct types of control mechanisms—output, process, and capability—represents the key theoretical contribution of the current research Accordingly, the key managerial implications that flow out of this research pertain to these joint effects

Although prior research has examined both output and process control (see Krause, Scannell, and Calantone 2000), capability has not been the focus of prior research attention Research results demonstrating a significant main effect of capability control along with its positive moderating effects on both supplier knowledge and supplier affective commitment speak to the importance of developing capability control over suppliers as a means to foster continuous supplier performance improvement In terms of action recommendations for managers, these results suggest that managers who are responsible for supplier performance should focus their attention on the supplier's underlying capabilities rather than solely on the tangible and concrete activities and outcomes Relative to the latter, however, underlying capabilities are difficult to access and may be even more difficult to discern However, given their important role in fostering continuous supplier performance improvement, it is essential that manufacturing firms focus their attention on assessing and developing the underlying capabilities of their suppliers In concrete terms, this means that manufacturing firms should work closely with suppliers to gain full transparency of supplier operations to assess supplier capabilities and to provide incentives that foster capability improvement Promoting a learning orientation within supplier organizations and ensuring the ongoing occurrence of learning through assessment and incentives represent key action recommendations for manufacturing firms that want to enhance supplier performance on an ongoing basis

Whereas prior research, particular within the quality movement (Forker 1997, see also Forker and Hershauer 2000, Forker, Ruch, and Hershauer 1999), has emphasized the importance of process control over supplier operations as a means to foster supplier performance improvement, the negative main effect of process control on continuous supplier performance improvement and its negative moderating effect on supplier knowledge (see Table 5) strongly caution against going down this route Although prior literature has advanced the case for process control on the basis that it ensures process conformance by suppliers, the results give credence to the argument that rather than generate conformance, process control appears to generate reactance among suppliers, thus fostering (rather than minimizing) deviant supplier behavior Thus, another key action recommendation for manufacturing firms arising from this research is that they should curtail their use of process control over supplier operations

Finally, the positive main effect of supplier output control and its positive moderating effect on supplier knowledge provide the empirical basis for the recommendation that manufacturing firms should provide suppliers with incentives (disincentives) for meeting (failing to meet) performance improvement targets, as a means to foster continuous supplier performance improvement This recommendation is consistent with action recommendations to managers based on prior research (e g , Krause, Scannell, and Calantone 2000)

In summary, the action recommendations for manufacturing firms are threefold To improve supplier performance on an ongoing basis, manufacturing firms should (1) deploy capability control over their suppliers, (2) establish output control over their suppliers, and (3) reduce the extent to which they exercise process control over their suppliers By introducing manufacturing firms to a previously undiscussed control mechanism in prior manufacturer–supplier literature—namely, capability control—and by encouraging them to revise their thinking on the efficacy of a control mechanism that has been discussed extensively in prior literature—namely, process control—this research offers important insights for manufacturing firms in their quest to improve supplier performance on an ongoing basis

Limitations and Future Research Ideas

Survey research typically involves the collection of perceptual data from a single source at a particular point in time

As such, it entails three limitations (1) use of a single data source for both dependent and independent variables, thus creating the potential for artificially high correlations, (2) use of perceptual data instead of more concrete measures, thus creating the potential for inaccuracies based on incorrect or incomplete perceptions, and (3) use of cross-sectional data to test cause–effect relationships, thus violating a key tenet for the establishment of causality—namely, that the cause must be empirically established to exist before the occurrence of the effect

The first limitation is addressed by drawing from separate data sources—the supplier and the manufacturer—to measure the independent variables and dependent variable, respectively However, the data are perceptual—that is, they comprise the perceptions of the survey respondents and are cross-sectional As discussed previously, the concerns arising from the use of perceptual data were addressed by (1) verifying respondent knowledgeability and (2) comparing each party's responses to the survey items To address these concerns further, additional research should consider the use of archival measures and in-depth examination of company records With respect to the third limitation—namely, the use of cross-sectional data to test causal arguments—further research should consider testing the model using experimental and quasi-experimental methodologies because these facilitate the temporal separation between cause and effect variables

In addition to addressing these methodological limitations, further research should attempt to deepen extant understanding of the collaborative communication–continuous supplier performance improvement relationship in two respects First, although this article examines the role of affective commitment as a mediator of the collaborative communication–continuous supplier performance improvement relationship, it represents only one of three components of the commitment construct, continuance commitment and behavioral commitment are the other two components (Gundlach, Achrol, and Mentzer 2005, Kim 1997a) Although the focus on affective commitment is appropriate in light of the attempt to identify an affective pathway between the independent and the dependent variables, it is necessary to obtain a more comprehensive understanding of (1) how the three components of commitment mediate the relationship between collaborative communication and continuous supplier performance improvement and (2) the way each of the three control types moderates these mediating effects This important task is left for further research Second, in their seminal work on collaborative communication, Mohr and Nevin (1990) identify three different types of channel conditions—structure (relational versus market), climate (supportive versus unsupportive), and power (symmetrical versus asymmetrical)—as potential moderators of the impact of collaborative communication on outcomes Further research should systematically investigate the moderating effects of these channel conditions on the collaborative communication–continuous supplier performance improvement relationship

Appendix

Results of Measurement Model 1: Collaborative Communication (Frequency, Reciprocal Feedback, Formality, and Rationality)

Collaborative communication was measured as a second-order factor model, with frequency (nine-item formative scale, all other scales are reflective), reciprocal feedback (six items), formality (six items), and rationality (three items) as the first-order factors

The fit statistics are as follows $\chi^2 = 411\ 24$, d f = 248, AOSR = 04, CFI = 97 Next, the standardized loading of each of the first-order factors on the second-order factor and of each reflective item on the first-order factor is presented

Collaborative communication (construct reliability = 81)

1 Frequency (adapted from Cannon and Homburg 2001) (standardized loading of frequency on collaborative communication = 89, t = 11 06, $p <$ 01)

- *Frequency of face-to-face communication* About how often does this customer interact with (once per day or more, 1–4 times per week, 1–3 times per month, 4–10 times per year, 2–5 times per year, once per year or less) (reverse scored)
  - Your company's sales/marketing personnel face-to-face?
  - Your company' s operations personnel face-to-face?
  - Other people from your company face-to-face?
- *Frequency of telephone communication* About how often does this customer interact with (once per day or more, 1–4 times per week, 1–3 times per month, 4–10 times per year, 2–5 times per year, once per year or less) (reverse scored)
  - Your company's sales/marketing personnel on the phone?
  - Your company's operations personnel on the phone?
  - Other people from your company on the phone?
- *Frequency of written communication* About how often does this customer interact with (once per day or more, 1–4 times per week, 1–3 times per month, 4–10 times per year, 2–5 times per year, once per year or less) (reverse scored)
  - Your company via electronic mail or EDI?
  - Your company via fax?
  - Your company via regular mail?

2 Reciprocal feedback (adapted from Fisher, Maltz, and Jaworski 1997) (standardized loading of reciprocal feedback on collaborative communication = 77, t = 9 84, $p <$ 01)

- This customer solicits our views on new product ideas on an ongoing basis (93)
- The customer responds promptly to communications from us (87)
- This customer has great dialogues with us (88)
- This customer provides us with a lot of feedback on our performance (73)
- This customer solicits our views on improvements to operational processes on an ongoing basis (69)
- This customer works hard to ensure that there is a lot of two-way communication between our firms (91)

3 Formality (adapted from Mohr, Fisher, and Nevin 1996) (standardized loading of formality on collaborative communication = 81, t = 10 35, $p <$ 01)

  - In coordinating their activities with our firm, this customer adopts formal communication channels (i.e., channels are regularized and structured as opposed to being casual and informal) (.95)
  - This customer has written down the terms of our relationship in detail (.61)
  - This customer has developed a set schedule of times at which they communicate with our firm over the course of a particular transaction (.74)
  - This customer has explicitly communicated their precise information requirements from our firm at particular points in time over the course of a particular transaction (.87)
  - This customer has explicitly verbalized and discussed the terms of our relationship (.53)
  - This customer has conveyed their expectations from the relationship to our firm in detail (.86)

4. Rationality (adapted from Payan and McFarland 2006) (standardized loading of rationality on collaborative communication = .76, t = 8.98, $p < .01$)
  - This customer provides specific information or data in order to make a case for a particular course of action that they would like us to implement (.93)
  - This customer provides justification for a particular course of action through research findings that they make available to us (.91)
  - This customer shares the results of their past experience with us in making a case for a particular course of action that they would like us to implement (.87)

Results of Measurement Model 2: Supplier Knowledge, Supplier Affective Commitment, and Continuous Supplier Performance Improvement

Measurement Model 2 comprised three constructs—supplier knowledge (five items), supplier affective commitment (six items), and continuous supplier performance improvement (eight items).

The fit statistics are as follows: $\chi^2 = 272.13$, d.f. = 153, AOSR = .03, and CFI = .98. Next, the standardized loading of each of the items on its respective factor is presented.

Supplier knowledge of manufacturer needs (adapted from Gwinner et al. 2005) (construct reliability = .79)

1. We have a good understanding of the needs of this customer (.78)
2. We have a good idea of how the needs of this customer will evolve in the near future (.84)
3. When this customer's needs evolve, we have a clear understanding of the product modifications that are necessary in order to meet this customer's new needs (.88)
4. When this customer is not happy with our product/service performance, we have a clear understanding of the corrective actions that are necessary (.77)
5. We have a good sense for what this customer wants (.73)

Supplier affective commitment (adapted from Anderson and Weitz 1992, Kim and Frazier 1997a, Mael and Ashforth 1992) (construct reliability = .86)

1. We have a strong sense of loyalty to this customer (.94)
2. When someone criticizes this customer, it feels like a personal insult to us (.87)
3. We think of this customer as part of our organization (.83)
4. We have a sense of partnership with this customer (.91)
5. We are pleased when we hear this customer being praised (.76)
6. We are proud to be associated with this customer (.82)

Continuous supplier performance improvement (adapted from Cannon and Perrault 1999) (manufacturer is source of data) (construct reliability = .81)

1. The supplier's product quality has improved over time (.78)
2. The supplier's delivery performance has improved over time (.94)
3. The supplier's performance on service and/or technical support has improved over time (.91)
4. The total value we receive from this supplier has improved over time (.81)
5. This supplier's ability to meet our needs has improved over time (.92)
6. This supplier has done more for us over time (.84)
7. Overall our satisfaction with this supplier has increased over time (.73)
8. The supplier's performance has been inconsistent over time (reverse scored) (.69)

Results of Measurement Model 3: Output Control, Process Control, and Capability Control (Adapted from Challagalla and Shervani 1996)

Measurement Model 3 comprises three constructs—output control (eight items), process control (six items), and capability control (six items).

The fit statistics are as follows: $\chi^2 = 321.06$, d.f. = 171, AOSR = .04, and CFI = .96. Next, the standardized loading of each of the items on its respective factor is presented.

Output control (construct reliability = .84)

1. We would get a larger share of this customer's business if we exceed our performance targets (.79)
2. Sales growth opportunities with this customer depend on how well we perform on our performance targets (.93)
3. We would be recognized by this customer if we perform well on our performance targets (.69)
4. There are share of customer increases if we do well on our performance targets (.71)
5. We would receive an informal warning if our performance targets are not achieved (.93)
6. We would receive a formal warning if our performance targets are not achieved (.91)
7. We would be put on probation if our performance targets are not achieved with some consistency (.88)
8. Our share of customer would suffer if our performance targets are not met (.93)

Process control (construct reliability = .79)

1. How well we perform specified production/operation activities would be considered when awarding contracts (.64)
2. If we perform production/operation activities well this customer would commend me (.69)
3. We would be recognized by this customer if they were pleased with how well we perform production/operation activities (.87)
4. We would receive an informal warning if the customer is not pleased with how we perform our production/operation activities (.88)

5 We would receive a formal reprimand if the customer were unhappy with how we perform our production/operation activities (91)
6 We would be put on probation if the customer is unhappy with how we perform specified production/operation activities (90)

Capability control (construct reliability = 77)

1 Assignment to preferred supplier status depends on how good my organization's production/operation and marketing skills are (68)
2 I would be commended if we improved our production/operation or marketing skills (83)
3 Opportunities to increase share of customer depend on how good the production/operation and marketing capabilities of my organization are (69)
4 We would receive an informal warning if the customer is not pleased with our production/operation or marketing abilities (77)
5 We would receive a formal reprimand if the customer is not pleased with our production/operation or marketing skills and abilities (79)
6 We would be put on probation if the customer is not happy with our production/operation or marketing abilities (85)

Control Variables: Results of Measurement Model 4 (Supplier Selection and Supplier Adaptation)

Measurement Model 4 comprises two constructs—supplier selection (three items) and supplier adaptation (five items)

The fit statistics are as follows $\chi^2 = 77\ 63$, d f = 45, AOSR = 02, and CFI = 99 Next, the standardized loading of each of the items on its respective factor is presented

Supplier selection (adapted from Chin-Chun et al 2006) (construct reliability = 93)

Prior to giving us their business, this customer evaluated us extensively on

1 Our quality control procedures (92)
2 Our ability to provide a high level of service to the customer (91)
3 The capabilities of our management team (96)

Supplier adaptation (adapted from Cannon and Perreault 1999) (construct reliability = 87)

Just for this customer

1 We have made changes to our product features (87)
2 We have made changes to our changes to our personnel (83)
3 We have made changes to our inventory management practices (94)
4 We have made changes to our operational processes (96)
5 We have made changes to our capital equipment and tools (77)

Age of relationship

1 Less than or equal to 2 years
2 Greater than 2 years and less than or equal to 5 years
3 Greater than 5 years and less than or equal to 10 years
4 Greater than 10 years and less than or equal to 15 years
5 Greater than 15 years

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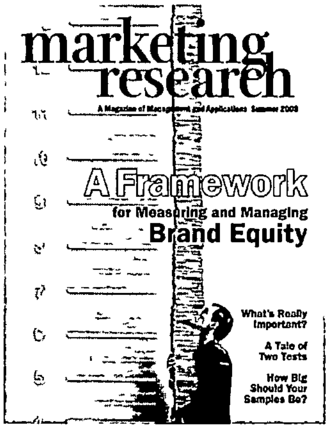
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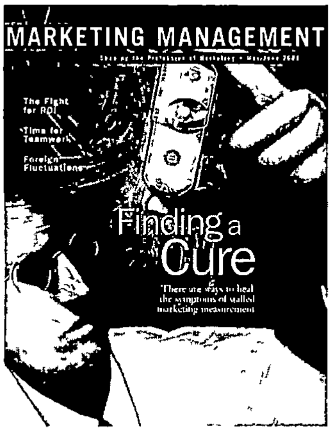

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AN OPEN LETTER TO MARKETING INSTRUCTORS

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Colleagues

For much of my career and I'm sure for yours also, we have been involved in an unholy alliance with the major publishers of marketing textbooks Here's the way it works In effect, marketing instructors say to the publishers "If you provide us with lots of teaching materials like instructors' manuals, testbanks PowerPoint slides, and expensive videos, all of which make life easy for us, we'll cooperate with you by adopting the textbooks you publish We'll turn a blind eye to the fact that your prices are gouging our students and their families We'll not allow the fact that marketing textbooks are routinely priced at over $150 bother us "

Well, I hope that marketing textbook prices at around $150 do bother you, they really bother me I do not suggest there are any particular content problems with the textbooks *per se* Of course, some are better than others, and each of us has our preferences Indeed, the major publishers compete for authors — my friends and colleagues — and work hard to deliver high quality products But there's one area of competition that seems to be absent from their market strategies — price competition! Throughout my career, I have watched textbook prices from all major publishers just climb higher and higher And don't believe the self-serving arguments that it's all of those expensive ancillaries that cost so much do you know any authors of instructors' manuals or testbanks who make a killing?

All of which brings me to the point of this letter Last year I published *Managing Marketing in the 21st Century* through Wessex Inc, a small independent publisher with national and international fulfillment **$45** for the printed book, **$25** for a read-online electronic version Several colleagues in the U S gave the book high praise before publication, and the feedback from adopting instructors and their students has been very positive In addition to several Columbia classes, instructors at Illinois Institute of Technology, China European International Business School (CEIBS), Johnson and Wales University, New York University, Rutgers University, Siena College, Simmons College, University of British Columbia, University of Illinois, University of New Hampshire, University of Southern Mississippi, and University of Texas (Austin) have adopted the book

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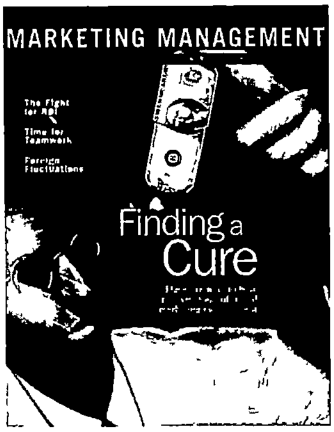

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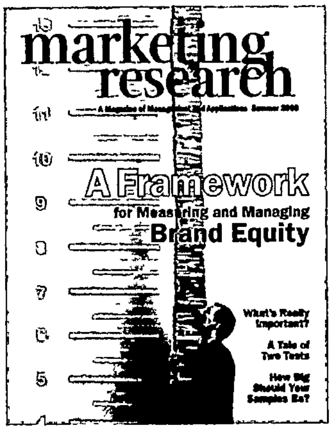
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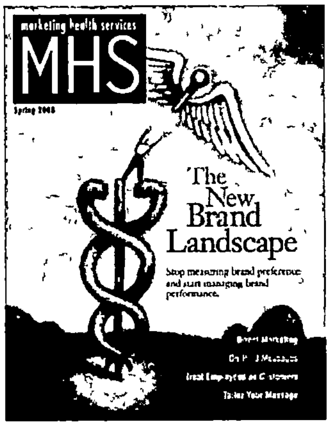

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Marketing Under Uncertainty: The Logic of an Effectual Approach

How do people approach marketing in the face of uncertainty, when the product, the market, and the traditional details involved in market research are unknowable *ex ante*? The authors use protocol analysis to evaluate how 27 expert entrepreneurs approach such a problem compared with 37 managers with little entrepreneurial expertise (all 64 participants are asked to think aloud as they make marketing decisions in exactly the same unpredictable situation) The hypotheses are drawn from literature in cognitive science on (1) expertise in general and (2) entrepreneurial expertise in particular The results show significant differences in heuristics used by the two groups While those without entrepreneurial expertise rely primarily on predictive techniques, expert entrepreneurs tend to invert these In particular, they use an effectual or nonpredictive logic to tackle uncertain market elements and to coconstruct novel markets with committed stakeholders

Keywords effectuation, uncertainty, expertise, service-dominant logic, cocreation

> [Service-dominant] logic suggests that organizations exist because the entrepreneur, with his or her bundle of skills, is able to (1) envision service that people want and will pay to obtain and (2) integrate together microspecialists to offer and provide this service In this sense one of the most important operant resources in society and the economy is the entrepreneurial spirit, and mental skills of the individual entrepreneurs and their collectivity (Vargo and Lusch 2006, p 53)

Consider the following scenario A knock on the door "Good morning, Professor I was in your modeling course I just got a job offer to run marketing for a startup Though uncertain, it looks like an exciting opportunity, and I hope you can introduce me to some best marketing practices in this setting because I haven't done anything like it before"

There is little theoretical foundation for a normative articulation of how marketing strategy decisions should be made in situations of uncertainty[1] Uncertainty is an attribute not only of entrepreneurial settings but also of virtually every environment in which marketing occurs today Drivers of this trend toward market volatility and uncertainty include market fragmentation, competitive pressures, and new customer tastes (e g , various kinds of ideological concerns, such as those for "green" products and services)[2] The traditional market definition and segmentation using market research, based on what Vargo and Lusch (2006) call goods-dominant logic, is problematic when the market is nebulous and the data are anecdotal Although their alternative paradigm, service-dominant logic, is extremely optimistic about the role of the entrepreneur (as evidenced in the opening quotation of this article), it offers little normative guidance as to how to *do* marketing in the face of uncertainty

In this article, we begin to fill the gap between existing marketing tools and the needs of managers who face uncertainty by giving a representative task to people with related real-world expertise and comparing their strategies with those without such experience The theoretical lens we use to focus our research design comes from entrepreneurship—in particular, a cognitive science–based logic of entrepreneurial expertise called "effectuation" Effectuation has substantial overlaps and synergies with recent developments in marketing theory as represented in the conversations (e g , Levy 2006) stemming from Vargo and Lusch's (2004, 2008a, b) exposition of service-dominant logic Throughout this article, we strive to clarify and connect key themes from both effectuation and service-dominant logic, with a view to cocreating value in the contribution of each to the history of ideas and the practice of marketing

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[1] However, there is useful "practitioner" literature on this topic (see, e g , Jagpal 1998)

[2] We thank a reviewer for pointing out the more general applicability of marketing under uncertainty

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We begin by introducing effectuation (Sarasvathy 2001a) as a specific logic under the larger umbrella of decision making under uncertainty We also trace effectuation's roots in the general literature on cognitive expertise and then outline its particular implications for marketing under uncertainty We do this first through a review of psychological research on expertise, followed by the development of hypotheses related to marketing under uncertainty, which we then empirically test against a contrasting sample of (1) managers with little entrepreneurial experience but training in normative marketing research and (2) expert entrepreneurs with significant new venture experience

The crux of our conceptualization of "uncertainty" consists of Knight's (1921) demarcation of it into known, unknown, and unknowable distributions The known and the unknown, both in theory and in practice, are conventionally tackled using predictive techniques Recent literature on entrepreneurial expertise (Read and Sarasvathy 2005) has claimed that the unknowable can be tackled using effectual logic, which eschews prediction Our aim is to take a first step toward applying this nonpredictive logic to marketing in any firm—large or small, new or old—faced with making marketing decisions under uncertain, unknowable conditions Therefore, we derive a set of propositions on how expert entrepreneurs using effectual logic and managers schooled in contrasting predictive techniques differentially solve marketing problems in uncertain situations

We use comparative verbal protocol analysis to test our propositions (Ericsson 2006, Ericsson and Simon 1993) This method involves presenting expert entrepreneurs and a comparison sample of managers who have little entrepreneurial expertise with a hypothetical business scenario in which they think aloud continuously as they (1) envision products/services that people might pay for and (2) make specific marketing decisions, such as selection of target segments, channels, and pricing The results show that while managers follow the predictive techniques presented in traditional marketing textbooks, expert entrepreneurs often invert these techniques through effectual logic The fundamental difference in the way the two groups make decisions is embodied in a set of heuristics that is internally consistent and thus provides a clear, normative logic for making marketing decisions under uncertainty Moreover, this logic has much in common with the evolution of a new paradigm in the discipline of marketing

Literature Review

Effectuation: A Logic of Entrepreneurial Expertise

Developed as a baseline against which to evaluate entrepreneurial expertise, effectuation inverts several principles that are central to normative theories of predictive rationality Particularly in the second half of the twentieth century, predictive rationality had been questioned Simon's (1991) assault on its empirical validity, based on the cognitive bounds of the human mind, inspired research on heuristics and biases that deviated from rationality Effectuation research was inspired by Simon's work and was developed in close collaboration with him (Sarasvathy 2002, Sarasvathy and Simon 2000) While bounded rationality has been construed by some researchers as a subset of predictive rationality, and the vast literature on heuristics and biases is considered a set of deviations from rationality, effectuation is an inversion of predictive rationality In short, as Sarasvathy and Simon (2000, p 5) note, effectuation turns predictive rationality upside down to answer the following question "Where do we find rationality when the environment does not independently influence outcomes or even rules of the game (Weick 1979), the future is truly unpredictable (Knight 1921), and the decision-maker is unsure of his/her own preferences (March 1982)?"

A static outline of the theory can be found in Sarasvathy's (2001a, b) work, and its dynamics have been worked out by Sarasvathy and Dew (2005a) Applications of an effectual logic to firm strategy are examined in Wiltbank and colleagues' (2006) work, and a book-length exposition can be found in Sarasvathy's (2008) work For the purposes of our study, we begin with a concise summary of effectuation, including five key constructs that differentiate it from normative theories on the basis of predictive rationality (see Table 1)

Effectuation inverts the fundamental principles, solution process, and overall logic of predictive rationality Predictive rationality rests on a logic of foresight—that is, to the extent that people can predict the future, they can control it Effectuation rests on a logic of nonpredictive control—that is, to the extent that people can control the future, they do not need to predict it Predictive rationality takes the environment as largely outside the control of the decision maker, who therefore attempts to predict and adapt to changes in it In an effectual view, the environment is endogenous to the actions of effectuators, who therefore attempt to cocreate it through commitments with a network of partner, investor, and customer stakeholders Effectuation also specifies three types of intangible resources with which the effectuator cocreates new ends (i e , new firms, products/services, and markets) through an iterative and interactive process of stakeholder acquisition Figure 1 graphically presents this process, and we describe it in more detail in the next section The point to note is that, as with service-dominant logic, effectual logic is "focused on intangible resources, the co-creation of value, and relationships" (Vargo and Lusch 2004, p 1) Before we describe other overlaps and distinctions between effectuation and predictive logic, we provide empirical examples to illustrate our theoretical exposition

Predictive Rationality and Effectuation: Empirical Examples

In Table 1, we present a series of constructs from predictive rationality that are inverted in effectuation A major thread of research in entrepreneurship sets out a predictive process that begins with the identification, recognition, or discovery of an opportunity, followed by a series of tasks that include (1) developing a business plan based on (2) extensive market research and (3) detailed competitive analyses, followed by (4) the acquisition of resources and stakeholders for implementing the plan, and then (5) adapting to the environment as it changes over time with a view to (6) creating

TABLE 1
Differences Between Predictive and Effectual Thought

	Fundamental Principles		Solution Process
Issue	**Predictive Approach**	**Effectual Approach**	**Key Managerial Questions Under Uncertainty**
View of the future	Predictive Predictive logic casts the future as a continuation of the past Accurate prediction is both necessary and useful	Creative The future is cocreated (at least in part) by willful agents, which may include investors, partners, and customers who "precommit" to the venture	*Is your environment stable enough that you can reliably base future actions on data from the past?* If the answer is no, concentrate your effort on actions that will create an environment in which your firm will have an inherent advantage or a leadership position, instead of building elaborate forecasts
Basis for taking action	Goal oriented Goals, even when constrained by limited means, determine subgoals and actions	Means oriented Goals emerge by imagining courses of action that begin from available means	*Have you made an inventory of your means?* This is the starting point for taking action under uncertainty, so list what you have, what you know, and who you know and put these assets to work
View of risk and resources	Expected return Pursue new opportunities based on the (risk-adjusted) expected value The focus is on the upside potential	Affordable loss Pursue satisfactory opportunities without investing more resources than stakeholders can afford to lose Limit downside potential	*Have you examined the worst-case scenario and considered mechanisms to outlive it?* Failure is likely in uncertainty Make small bets, so when you fail, it is not catastrophic, and you can incorporate the learning into the next iteration of the opportunity instead of having to terminate the project
Attitude toward outsiders	Competitive analysis Protect what you have and maximize your share of the opportunity	Partnerships Share what you have with committed partners because relationships (particularly with shared rewards) shape the trajectory of the opportunity	*Who can and will create this opportunity with you?* And how can you gain their commitment? This means finding partners with complementary skills or assets and being willing to share in the upside with them so they will engage to create the opportunity with you
Attitude toward unexpected events	Avoid Surprise is bad Prediction, planning, and focus enable the firm to minimize the impact of unexpected events	Leverage Surprise is good Imaginative rethinking of possibilities transforms the unexpected into new opportunities	*Are you looking for positive surprises?* Look at surprises not from the perspective of how they upset your existing plans but rather how you can shift actions so that you are, or will be, the beneficiary of a surprise

Source Sarasvathy and Dew (2005a)

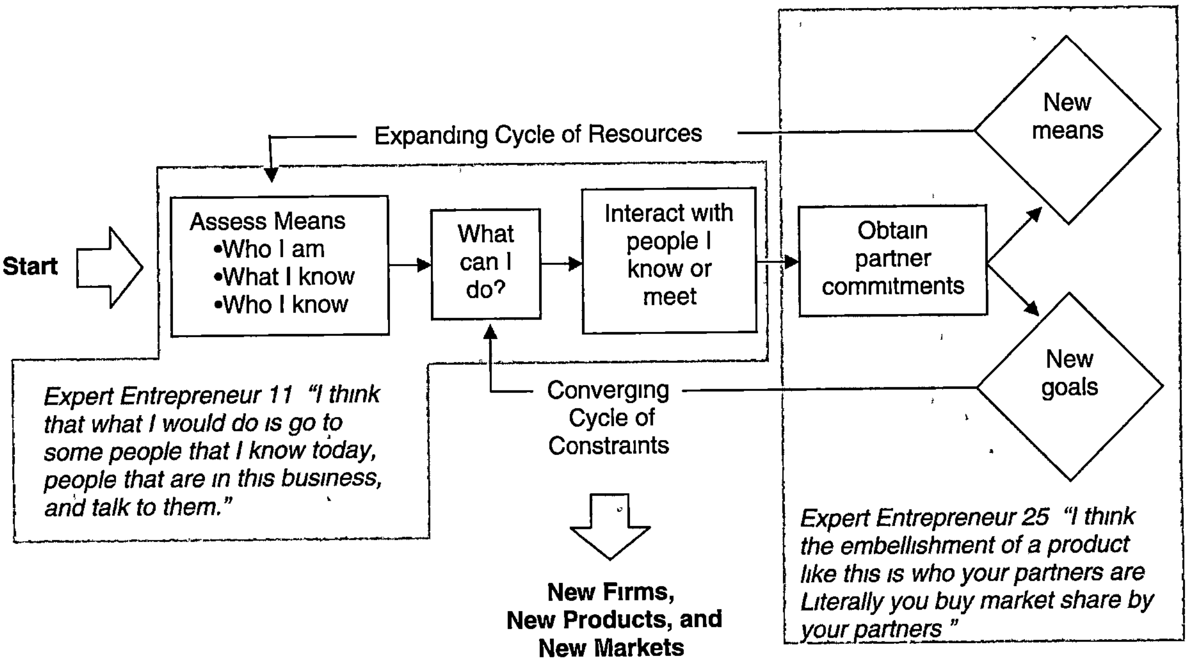
and sustaining a competitive advantage (Gartner 1985, Varadarajan and Jayachandran 1999) In this predictive view, if a manager with little entrepreneurial expertise wanted to open a restaurant, he or she would begin by identifying a high-potential location, analyzing the competition in the area, identifying particular target segments, developing marketing strategies to fit the targets, obtaining necessary funding, hiring the appropriate chef to develop the right menu, and then opening the doors to the restaurant

In contrast, as Figure 1 shows, effectuators would begin with the means available According to who they are, what they know, and who they know, they would begin with a list of things they can afford to do In the restaurant example, the effectual entrepreneur may or may not begin with a location, this would depend on who the effectuator is If the effectuator is a cook, he or she may forgo identifying high-potential locations and just hire him- or herself out as a chef who does house calls—it depends on what the chef can afford to invest in terms of money, time, and emotion He or she would start by calling people he or she knows and putting together commitments from partners For example, if the chef knew a grocery store owner, he or she might make dishes for the deli, or if the chef knew someone in the popular media, he or she might produce cooking videos, and so on The nature of the venture depends on which stakeholders come on board and the contingencies that occur along the way Using this stakeholder-dependent process, the effectuator sets in motion two contrasting cycles The first is an expanding cycle that increases the resources available to the venture, and the second accretes constraints on the venture that converge into specific goals over time

The result of the predictive process is determined by the initial "opportunity" identified and the adaptive changes made in marketing strategy over time to fit a preselected "market" and/or "vision" The end product in effectuation is fundamentally unpredictable at the beginning of the process Indeed, the opportunity and even the market itself

FIGURE 1
The Effectual Process (Sarasvathy and Dew 2005b) Contrasted with the Predictive Process (Adapted from Gartner 1985) Illustrated with Select Transcript Quotes

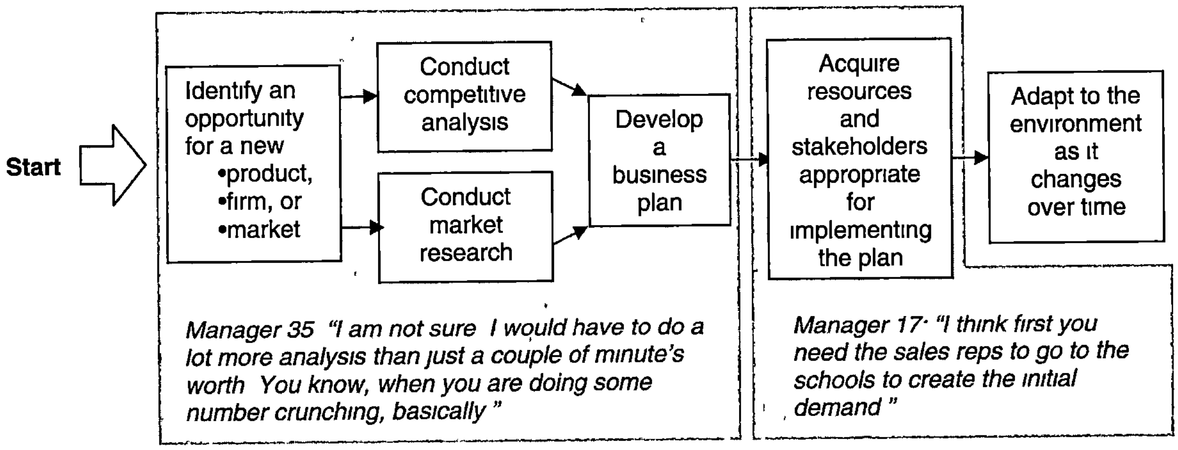
A: The Effectual Process


Start
Expanding Cycle of Resources
Assess Means
•Who I am
•What I know
•Who I know
What can I do?
Interact with people I know or meet
Obtain partner commitments
New means
New goals
Converging Cycle of Constraints
New Firms, New Products, and New Markets

Expert Entrepreneur 11 "I think that what I would do is go to some people that I know today, people that are in this business, and talk to them."

Expert Entrepreneur 25 "I think the embellishment of a product like this is who your partners are Literally you buy market share by your partners "

B The Predictive Process


Start
Identify an opportunity for a new
•product,
•firm, or
•market
Conduct competitive analysis
Conduct market research
Develop a business plan
Acquire resources and stakeholders appropriate for implementing the plan
Adapt to the environment as it changes over time

Manager 35 "I am not sure I would have to do a lot more analysis than just a couple of minute's worth You know, when you are doing some number crunching, basically "

Manager 17· "I think first you need the sales reps to go to the schools to create the initial demand "

can be an outcome of and generated through the very process of effectuation In other words, both market and opportunity are contingent on who comes on board and the actions and goals they enable and constrain, initial goals and visions of an opportunity seldom determine who comes on board or what resources are gathered under an effectual approach

The exaggerated dichotomy we describe here creates a powerful theoretical separation between effectuation and predictive rationality Empirically, both predictive and effectual processes may be at work in tandem Therefore, we expect the data to contain decisions and actions that confound the two Yet preliminary investigations in expert entrepreneurial decision making (Sarasvathy 2001b) and early-stage investing (Wiltbank et al 2009) indicate that strong patterns of effectual and predictive decisions can be isolated In the current study, we apply these principles of effectual expertise to specific marketing problems under uncertainty To do this, we need to grasp the methodological roots of effectuation in the larger literature on cognitive expertise and trace its theoretical connections to conceptions of uncertainty We turn to these tasks next

Expertise

Investigation of expertise using modern approaches began approximately 30 years ago, focusing on understanding chess masters (Chase and Simon 1973).[3] Despite expectations to the contrary, early studies of expert chess players concluded that intelligence had no correlation with chess mastery (Doll and Mayr 1987). Expert players had learned unique ways of storing information (Butterworth 2006), perceiving problems, and generating solutions (Gobet and Charness 2006; Greeno and Simon 1988). While early empirical efforts focused on chess, subsequent work has validated and expanded these findings to more dynamic and complex settings, such as medicine (Norman et al. 2006; Rikers et al. 2002), fire fighting (Klein 1998), software development (Sonnentag, Niessen, and Volmer 2006), and consumer decision making (Alba and Hutchinson 1987). Experience alone does not develop the unique decision-making heuristics observed in experts (Camerer and Johnson 1991). Evidence of superior performance is also necessary, and though expert intelligence is not subject to age-related decline (Masunaga and Horn 2001), expert decision-making heuristics can be negatively affected by biases, particularly those involving prediction of outcomes (Shanteau 1992).

Managerial Expertise in Marketing

Scholarship in marketing has largely ignored the role of managerial expertise. In the earliest piece identified in our search, Larreche and Moinpour (1983, p. 119) show that experts "provide significantly better estimates than those obtained by other approaches," but they go on to lament that "the relevant issue, of course, is identifying 'experts.'" Given the strength of their findings, we were surprised to locate only four subsequent pieces on the topic. In chronological order, Sujan, Sujan, and Bettman (1988) demonstrate more sophisticated knowledge structures in expert salespeople than in those with less experience. Perkins and Rao (1990) show that higher levels of uncertainty surrounding a problem increase the positive impact of experience on performance. Spence and Brucks (1997) argue that the greatest difference between expert and novice performance exists when a task is ill-structured but that performance is reasonably similar for well-structured and completely unstructured tasks. The most recent work we found on marketing expertise argues that entrepreneurs with more experience are better able to make use of information inputs, such as marketing data and marketing management support systems, than their peers with less experience (VanBruggen, Smidts, and Wierenga 2001).

Entrepreneurial Expertise in Uncertainty

According to Hebert and Link (1988), since the earliest history of economic thought on entrepreneurship, it has been inextricably intertwined with uncertainty. In short, entrepreneurial expertise equals expertise in uncertainty. The canonical thesis on this equality can be found in Knight's (1921) seminal work on the relationship between profit and unpredictability. "Knightian" uncertainty removes the assumption that phenomena can be modeled and predictions can be accurately made based on historical data. Situations in which the past is not a reliable predictor of the future are where our work finds its home because effectuation provides heuristics that use the nonpredictive techniques that are characteristic of expert decision making in entrepreneurial settings. To apply effectuation to marketing under uncertainty, we need to connect both its roots in expertise and its branches in heuristics to hypothesize how to overcome uncertainty in explicit marketing decisions. We take up this task in the next section.

Propositions

Effectuation, Expertise, and Marketing Strategy

The central concept in effectuation is the logic of nonpredictive control. Therefore, our central proposition based on effectuation is related to the use of predictive information:

> Expert entrepreneurs are likely to ignore or underweight predictive information in making marketing decisions in the new venture setting, instead relying on strategies that enable them to directly control, cocreate, and transform situations toward positive outcomes.

Merely on the basis of symmetry, we can argue that managers without entrepreneurial expertise would do the opposite—that is, rely on predictive information to make marketing decisions. This argument is also borne out by common sense and published evidence. Normative work, offered in textbooks (Kotler and Armstrong 1999) and popular literature (Ries and Trout 1985), has largely followed the old dominant logic in marketing. This has meant applying predictive approaches based on market research and competitive analysis to the development and execution of marketing strategies to achieve the highest possible returns and market share for existing and new ventures.

As Vargo and Lusch (2004) describe, at least part of the reason for the way concepts and theories in marketing have developed over the twentieth century is rooted in the macroeconomics of exchange of physical and manufactured goods and the microeconomics of profit maximization by the firm. Understandably, the empirical bases for this theoretical evolution are studies of large and/or established corporations operating within well-defined or mature markets. Despite rising discontent in the last decade of the twentieth century, evidenced in calls for a new paradigm (Achrol 1991; Day and Montgomery 1999; Sheth and Parvatiyar 2000; Webster 1992), most basic marketing courses in business schools continue to emphasize the four Ps (price, product, promotion, and placement) and various tools designed to predict demand better and analytically capture predetermined markets instead of the cocreation of both through innovative deployments of operant resources in ongoing relationships between marketing stakeholders.

In summary, although we cannot be sure what the average person on the street, utterly unschooled in marketing, might do when faced with a marketing decision, we can expect that the manager who is trained in normative marketing (whether acquired formally in a business school or through the popular press) but does not possess entrepreneurial expertise is likely to take predictive information seriously and invest in it heavily.

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[3] De Groot ([1946] 1978) began sporadic work on the topic as early as 1946.

As our next task, we attempt to provide sturdy legs to support this broad central hypothesis, legs consisting of particular heuristics that are relevant to marketing decisions under uncertainty. We draw from both the larger literature on general expertise and the more specific literature on entrepreneurial expertise. The first four propositions stem from an integration of effectuation with the expertise literature. The final three relate effectuation heuristics to predictive principles of marketing. After we describe the data, analysis, and results involved in testing these hypotheses, we turn to an in-depth discussion of how an alternative set of prescriptions for marketing under uncertainty based on effectual logic may cohere and cumulate with recent new developments, including Vargo and Lusch's (2004) notion of a service-dominant logic, Hunt and Morgan's (1997) resource-based arguments, Jaworski and Kohli's (2006) cocreation perspective, Rust, Lemon, and Zeithaml's (2004) conceptualization of customer equity, and Berthon and John's (2006) seven value dimensions of interactions as perceived by clients.

Hypotheses Based on Expertise in General

Market research. The first proposition stems directly from our central hypothesis based on effectuation, namely, expert entrepreneurs likely ignore predictive information. This proposition is reinforced by the literature on expertise in general. Experience and deliberate practice are the sources from which experts develop much of their knowledge (Ericsson 2006). In contrast, those without experience rehearse skills in the context of "classroom" or practice problems, divorced from the actual domain of decision making (Schenk, Vitalari, and Davis 1998). This distinction is critical. Managers with limited exposure to real-world problem solving have little of the episodic knowledge that is at the disposal of expert entrepreneurs, resulting in distinctly different problem-solving approaches.

Because expert entrepreneurs spend more time trying to understand decision problems and have refined perceptual abilities based on intensive practice and familiarization in their domain (Hutton and Klein 1999), they are more likely to define carefully the relevant features of decision problems and, consequently, are less likely to rely on predictive information. Experts also process and organize significant bodies of knowledge (Glaser 1996) necessary to make good decisions without a great reliance on external inputs, particularly predictive ones (Rikers et al. 2002). Instead, experts have learned to filter information automatically from external sources (Leifer 1991), validating it against patterns from previous experiences (Chase and Simon 1973).

In marketing management, this limited reliance on predictive information is an important factor distinguishing expert entrepreneurs. They have an ability to judge typicality on the basis of their store of patterns built over years of deliberate practice. They recognize environments in which the value of predictive information is low, both because such information is perishable in fast-moving uncertain environments and because this information does not account for the impact of actions they will take (Van Heerde, Dekimpe, and Putsis 2005). As George Bernard Shaw once said, "In literature, the ambition of the novice is to acquire the literary language, the struggle of the adept is to get rid of it." Similarly, in uncertain situations, managers without domain-specific experience learn the textbook tools of market research, while expert entrepreneurs seek alternatives. Therefore, although some managers may have great stores of semantic or factual knowledge of a domain, they may lack practical experience in dealing with uncertainty. Given the predominant emphasis of research and textbook literature on using predictive information, such as historical market data to build sophisticated models, we expect the following:

> P_1 (market research): When making marketing decisions in an uncertain business situation, people higher in entrepreneurial expertise are more likely to be skeptical about market data, while those lower in entrepreneurial expertise are more likely to take market data as given and credible.

Prior experience and analogical reasoning. The knowledge mechanisms that expert entrepreneurs substitute for market research is the subject of our next proposition. Through deliberate practice, experts have, among other things, developed a database of patterns that they can access when solving future problems (Gobet and Simon 1996). The question is whether entrepreneurial experts will actually apply this unique knowledge to the modeling of solutions for problems in the uncertain situations of product development and market creation as do chess and computer-programming experts to their tasks (Adelson 1984). From prior work, we know that experts automatically store information according to outcomes (Ericsson and Kintsch 1995). Because experts match and recognize stored patterns against existing situations (Reingold et al. 2001), they are likely to retrieve strategies they know they can implement (Kalakoski and Saariluoma 2001). For example, in their think-aloud protocol study of real-world industrial designers, Dahl and Moreau (2002) show the importance of pattern recognition and analogical reasoning in new product development. From a summary of this work, which includes variation in the indicators of expertise, we expect that while managers are likely to use problem data as the basis for taking action, expert entrepreneurs build strategies that draw on analogies to prior experience. Formally,

> P_2 (prior experience): When making marketing decisions in an uncertain business situation, people higher in entrepreneurial expertise are more likely to use analogical reasoning based on experience than those lower in entrepreneurial expertise.

Affordable loss. Expert entrepreneurs are also likely to differ from managers in how they employ available resources. Effectuation suggests that expert entrepreneurs know through past experience and actual practice that success cannot be predicted when facing uncertainty but that the occurrence of failure can be significantly controlled (Sarasvathy 2001a, Sarasvathy and Menon 2003) Affordable loss refers to the tendency of expert entrepreneurs to evaluate an investment according to whether they could survive the total failure of an initiative A preference for the cheapest, if not free, options and for quickly realized small successes and small failures tends to dominate In contrast, the predictive method of forecasting expected values and selecting initiatives according to their predicted worth considers investment requirements only against possible returns By taking action based on affordable loss rather than on predicted values, the risk involved in any one action cannot put an entire project in jeopardy Although this tactic may have unintended consequences, such as underinvesting in attractive options or moving too quickly down unproductive paths, it provides a means of achieving some control over the occurrence of failure Using protocol analysis, Mukhopadhyay, Vicinanza, and Prietula (1992) present empirical evidence from a panel of experts in software project cost estimation who employ this heuristic and produce superior performance to mathematical models and computer simulations As a result, we expect the following

> P_3 (affordable loss) When making marketing decisions in an uncertain business situation, people higher in entrepreneurial expertise are more likely to consider how much money they have and what the effort is going to cost than those lower in entrepreneurial expertise

Decision framing The task of building new organizations, product innovations, and/or new markets is nontrivial In general, experts have acquired a highly adapted set of cognitive skills and a deep understanding of the nature of their own problem domain (Bettman and Sujan 1987, Ericsson and Charness 1994) Because of the uncertainty associated with tasks in the domain of new firm, product, or market creation, how decision makers frame problems is critical Studies of the organization of information by experts and novices show that experts approach problem situations with more understanding than novices Experts are more likely to frame problems comprehensively, using a top-down framework or schema, within which they contextualize specific decisions and link them to other decisions In contrast, novices tend not to frame problems within a conceptual scheme but rather approach them from the bottom-up and according to surface characteristics rather than their underlying structures (Mackay and Elam 1992) Experts' ability to group problems into fundamental categories and relate them to other decisions results in knowledge architectures that link multiple occasions of connected decisions in the task domain over time, with feedback and interpretation This capability of expert entrepreneurs to frame and contextualize problems inherent in marketing a new product or new venture leads us to expect the following

> P_4 (decision framing) When making marketing decisions in an uncertain business situation, people higher in entrepreneurial expertise are more likely to explicitly visualize building a whole business, while those lower in entrepreneurial expertise are more likely to make isolated marketing decisions

Hypotheses Based on the Marketing Mix

We now focus attention on applying effectuation to a specific mix of marketing activities In each area, we theorize about expert entrepreneurial strategy as guided by effectuation and contrast it with a representative practical expectation from current marketing texts or literature

Market and product Expert entrepreneurs' experience and practice in uncertain new venture settings teaches them that market targets and product offerings can be considerably transformed along the path from concept to acceptance Thus, value proposition change is a pattern that experts are accustomed to and actively embrace (Sarasvathy and Kotha 2001) In contrast to this view is the textbook prescription from the old dominant logic in marketing that advises beginning with the selection of a target market for a predefined product or service and proceeding to build elements of price, promotion, and placement around that product or service (Kotler and Armstrong 1999) Theoretical arguments for feedback loops in which the product is generated by the process (Vargo and Lusch 2004) and even exhortations to move to a network perspective (Achrol and Kotler 1999) exist Yet empirical evidence demonstrates that adherence to well-defined product offerings is still the norm, for example, Biyalogorsky, Boulding, and Staelin (2006) explain why marketing managers persist with their offering even when the product has failed in the market Consequently, we expect the following

> P_5 (market and product) In an uncertain business situation, people higher in entrepreneurial expertise are more likely to consider more alternative markets, even if the option necessitates product or strategy change, while those lower in entrepreneurial expertise are more likely to accept target markets and products as given

Pricing Confounding prescriptions from traditional marketing literature make pricing a dilemma On the one hand, producers have incentives to underprice products early on in the hope of penetrating the market, driving adoption (Katz and Shapiro 1986, Rogers 1995), and capturing value later in the cycle On the other hand, they have contradictory incentives to "skim" profits from early adopters who are typically less price sensitive (Kotler and Armstrong 1999, Nagle and Holden 1994) What is likely to separate expert entrepreneurs from less experienced managers is both the process by which they arrive at the pricing decision and the outcome of the decision Expert entrepreneurs approach the pricing issue "locally," according to information gained from their interactions with stakeholders (Sarasvathy 2001a) They learn the value that each customer derives from an evolving value proposition and how this value is derived, and they generalize price as the process unfolds Because managers with less entrepreneurial experience are likely to develop pricing based on segmentation ideas and the target market they preselect, their pricing approach needs to be relevant to the chosen customer segment Indeed, pricing is often a factor that describes the segment itself Consequently, managers are likely to set prices in terms of a "lowest common denominator" for a given segment, while expert entrepreneurs are likely to price on the basis of the highest level of value they have uncovered through interactions with individual customers (see Berthon and John 2006)

P_6 (price) In an uncertain business situation, people higher in entrepreneurial expertise are more likely to price higher to capitalize on the value they have identified to a specific customer (skim pricing), while those lower in entrepreneurial expertise are more likely to price lower to penetrate entire target segments (penetration pricing)

Channel Effectuation predicts that expert entrepreneurs are cognizant that successful ventures involve complete and complex webs of stakeholder relationships, with stakeholders bringing resources and ideas to a new venture as well as obligations (Sarasvathy 2001a) We expect that expert entrepreneurs will build stakeholder relationships directly, one step at a time, as part of the process of creating a market, firm, or product A result of this effort is that experts will generate rich, firsthand knowledge related to the effort and will quickly have a sense of whether the business has real promise However, this practice will also color the way they approach distribution of the product because relationships will create the market As a result, we expect that the channel strategy the expert entrepreneurs use will be contingent on partnerships and therefore will be relatively narrow In contrast, managers will sell to as many segments as they rationalize to be profitable through channels that have broad reach and appeal

P_7 (channel) In an uncertain business situation, people higher in entrepreneurial expertise are more likely to develop a focused channel strategy around partnerships to serve a narrow customer group, while those lower in entrepreneurial expertise are less focused, selling to more segments through more channels and being less dependent on partnerships

The Study

Method

First, we operationalized expertise as a set of criteria for sample selection Second, we developed a research instrument to present an uncertain situation and to capture the information-seeking tasks involved in discovering and/or creating the market for a new product Third, participants completed the think-aloud task, and their concurrent verbal protocols were collected Fourth, we coded, analyzed, and reported protocols

Protocol Analysis

Because our objective was to understand the heuristic differences in decision making associated with entrepreneurial expertise, we selected the method of concurrent verbal protocol analysis Pioneered largely in psychological studies of expertise, this approach calls for analysis of the transcripts of participants thinking aloud during problem-solving tasks As designed, the intent of the method was to gain insight into real-time cognitive processing (Ericsson and Simon 1980), initially using the game of chess (Charness 1989) The method was designed to minimize the bias associated with retrospective recall and to gain visibility into the decision-making steps often obscured using stimulus–response methods, which analyze only decision outcomes, not processes [4] Some examples of protocol analysis studies in entrepreneurship include venture capitalist investment selection criteria (Hall and Hofer 1993) and entrepreneurial decision framing (Dew et al 2009) Examples in marketing include consumer choice processes (Cooper-Martin 1993), pretesting questionnaires (Bolton 1993), brand extension (Boush and Loken 1991), and retail sales projections (Cox and Summers 1987)

Participants

Our study includes a sample of 27 expert entrepreneurs and 37 managers with little entrepreneurial experience, with a robustness check using 34 executives We operationalized expert entrepreneurs as having founded one or more firms and having remained with at least one of the ventures through ten years of operation, the initial public offering, and the achievement of a minimum of $200 million in annual revenues These criteria ensured that our expert entrepreneurs spent the required amount of time in domain-specific deliberate practice, achieved an extraordinary level of performance in a situation, and thus could be considered experts (Ericsson and Lehmann 1996) We identified these experts by combining a list of the 100 most successful entrepreneurs from 1960 to 1985 (Silver 1985) and the list of national winners of the Entrepreneurs of the Year awards, compiled by Ernst & Young The expert entrepreneur sample contains broad industry diversity, ranging from transportation to medical devices and consumer products, and all the entrepreneurs are men The sample is 90% American, ages range between 40 and 82 years, and two-thirds have advanced degrees On average, participants founded seven firms

Our requirements for a comparison sample of managers included (1) having sufficient knowledge to address the questions in the research instrument but (2) not having entrepreneurial expertise We selected 37 graduate students in business administration Participants are 97% American, ages range between 26 and 46 years, and their experience lies primarily in large organizations As with the experts, they have diverse industry backgrounds, including acquisitions and procurement, supply and logistics, human resources, operations, and medical services Only 1 had started multiple ventures (two ventures), and 87% had never been part of a start-up

The choice of MBA students as a comparison sample follows a precedent of using students in expertise experiments from psychology (Lehmann and Norman 2005) as well as in marketing research (Armstrong and Collopy

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[4] This is particularly problematic for experiments that are sufficiently simple so that a participant can generate the solution in his or her head (Ericsson and Simon 1993) If the solution can be generated in a single step, the researcher will fail to see into the "black box" and will consequently not gain insight into the process of cognitive processing Because our scenario has no correct answer and offers participants a nearly infinite solution set, we believe that we have mitigated this risk, thus gaining meaningful insight into the heuristics of expert entrepreneurs We appreciate a reviewer for suggesting this

1996) To conduct an additional robustness check on the uniqueness of our expert entrepreneur sample—namely, to ensure that the differences we observed are indeed due to their entrepreneurial expertise—we validated our findings against a second sample of 34 executives with an average of more than 14 years of experience and senior positions at major multinational firms spanning functions, industries, and geographies but without any significant new venture experience Business executives differ from expert entrepreneurs on all the same dimensions as the students, except for pricing and use of personal selling

Research Instrument

Participants were administered the instrument individually, in a standardized format Then, they were provided a detailed written description of an imaginary game of entrepreneurship called "Venturing" After participants finished reading the description, they were presented with the following five written questions and asked to read the questions aloud, this ensured that they all experienced the questions in the same order and format

1. Who could be your potential customers for this product?
2. Who could be your potential competitors for this product?
3. What information would you seek about potential customers and competitors? List questions you would want answered
4. How will you find out this information? What kind of market research would you do?
5. What do you think are the growth possibilities for this company?

After responding to the first five questions, participants were presented with two pages of market research information related to the opportunity for the Venturing product After reviewing the information, participants received the following three additional written questions, again in a standardized format and order

1. Which market segment/segments will you sell your product to?
2. How will you price your product?
3. How will you sell to your selected market segment/segments?

A professional service recorded and transcribed the entire interaction All participants were asked to commit a minimum of 30 minutes to the experimental task All the participants completed the interaction without time pressure, and members of both groups remarked that they found both the scenario and the questions to be engaging and representative of the kinds of issues they faced or might expect to face in the context of creating a new opportunity

Coding

We developed a coding scheme to extract relevant variables and counts using the helix process that Ericsson and Simon (1993) describe This process generates scheme items along a particular axis, such as the dimensions of expertise in general and marketing decisions in particular, using sequential coding iterations The iterations began with one of the principal investigators randomly selecting two expert entrepreneur and two manager protocol transcripts and creating a list of specific scheme items The same researcher expanded the list by adding items from other protocol transcripts, testing, adding, deleting, and refining items iteratively until new protocol transcripts yielded no modifications The converged scheme was then tested by two other principal investigators, who used the coding scheme to recode the same protocol transcripts independently During these iterations, we made three minor modifications, resulting in an inventory of variable descriptions and operationalizations (see Table 2)

To check interrater reliability, an independent coder recoded both the expert entrepreneur and the manager protocols using the scheme in Table 2 The two sets of codings were compared for reliability The first pass at independent codings revealed strong agreement on all but two variables Further clarification of the variable definitions between the principle investigators and the independent coder resulted in a strong mean interrater agreement across all variables in this study of 78, with no agreement less than 62, calculated using the proportional reduction in loss (PRL) approach (see Rust and Cooil 1994) The PRL interrater agreement scores appear for each variable in Table 3 We performed analysis of variance or chi-square tests depending on whether the variables were scale or dichotomous

Results

P_1 (Market Research)

We expected that managers with less entrepreneurial experience would be more likely to take market research data as given, while expert entrepreneurs would be more likely to question it We looked for comments that reflected skepticism regarding the data presented in the scenario or in market data in general, and we tagged participants who made such comments "nonbelievers" "Believers" did not question the data An example of a nonbeliever's transcript is as follows

> Expert Entrepreneur 15 I don't win much from market research It's always been very bad in my projects
>
> Interviewer Very, very bad, or don't you believe in it? Which one?
>
> Expert Entrepreneur 15 I don't believe in it I think so many people fail in getting something done because they analyze too much

This approach is in contrast to that of Manager 10, a believer who accepts the numbers and is willing to base his market strategy choice simply on their magnitude

> I am looking at the market here, it talks about estimated dollar value of instructional technology [being] $1 7 billion You got the dollar of the interactive game, which is $800 million, and both expect to earn 20% So both are good markets Obviously, $1 7 billion is grabbing my attention because it seems like a bigger market, and [we] would probably be able to make more money in that market just from looking at it

A chi-square comparison of the expert entrepreneur and manager groups revealed that expert entrepreneurs were significantly more likely not to believe market data ($p <$ 001), in support of P_1

TABLE 2
Variable Operationalizations

Variable	Coding Question
Market research	Did this person believe the numbers? Enter "Yes" or "No" (Even if you are not 100% sure as to yes or no, please circle based on your overall judgment—whether largely yes or largely no)
Prior experience	Did this person go beyond making marketing decisions to talk about building the business as a whole? Enter "Yes" or "No" If yes, count how many times they mentioned insights from previous experience
Affordable loss	Did this person worry about how much money he or she has and what the costs of executing his or her marketing decisions will be? Enter "Yes" or "No" If yes, count how many times
Decision framing	Did this person go beyond making marketing decisions to talk about building the business as a whole? Enter "Yes" or "No"
Decision framing long-term	Did this person go beyond making marketing decisions to talk about building the business as a whole? Enter "Yes" or "No" If yes, count how many times they mentioned issues related to the long-term
Market and product	Check each of the markets listed if person wanted to sell to them (there were a total of 41 categories, we list 3 examples here)
Price qualitative	Did this person select price on the basis of it being high with the intent of maximizing profit (skim)? Did this person select price on the basis of it being low with the intent of maximizing adoption (penetration)? Enter "Skim," "Penetration," or "No"
Price quantitative	Did this person pick a single price or a single price range? If yes, quantitatively, what was it?
Channel all direct sales	Check off channels they used Direct sales
Channel personal direct sales	Check off channels they used Direct sales "I will personally call" (other option was "I will recruit salespeople")
Channel partnerships	Did this person visualize partnering or building a relationship with someone? Enter "Yes" or "No" If yes, count number of partnerships
Channel number of channels	Check off channels they used
Channel number of segments	Check off segments to which they decided to sell

P$_2$ (Prior Experience and Analogical Reasoning)

Because expert entrepreneurs have developed superior pattern-matching and pattern recognition skills for uncertain situations than managers, we expected that they would draw on prior experience in decision making more frequently than managers To test this, we counted each instance in which a participant referred to previous experience A comparison of the expert entrepreneur and manager groups offers support for P$_2$, expert entrepreneurs were more likely to use previous experience than managers ($p <$ 001) We present a transcript excerpt from a manager and an expert entrepreneur who draw on prior experience to make a decision

> Manager 20 I would look at business schools, the better business schools and colleges across the United States Going back to my own experience, I went to Miami in Ohio, and I think that the type of atmosphere that that business school created would lend itself well to this type of research, and I'm sure that that's not limited to just that school

> Expert Entrepreneur 22 I like all but retailing I would not spend that money And that's a huge cost to do it And I know that from my own experience with the company How do you get shelf space? And the right shelf space? How do you get the minds of people to understand your product and want it?

P$_3$ (Affordable Loss)

As with P$_1$ and P$_2$, we did not ask any specific questions about cost so as not to prime participants on the topic We also did not present participants with a fixed amount of money to work with in the scenario Instead, we analyzed the transcript data, looking for comments and questions regarding the amount of money available to the project and for decisions in which cost was a factor We found that expert entrepreneurs were significantly ($p <$ 001) more likely to consider available financial resources when making decisions regarding the scenario, in support of P$_3$ In the following transcript excerpts, Expert Entrepreneur 11 considers cost three times (italics are added to highlight these mentions) as he makes a channel decision, in contrast, Manager 10 is drawn to the opportunity associated with the greatest possible financial upside, with no mention of cost

> Expert Entrepreneur 11 So the Internet seems to really be actually a surprisingly effective way to communicate at *a pretty low cost* So the bookstores, that seems *very, quite expensive*, with a lot more support needed And direct to educational institutions seems also a lot more complex needing training I think I have a little difficulty making the decisions not knowing *how much money, maybe I do know how much money* I have to work with

> Manager 10 I tend to want to look over the information here a little more just to get a better feel I guess the biggest thing I want to focus on is, as an entrepreneur, you want to go up with a product that you think is going to earn you the most money, revenue, and profits

P$_4$ (Decision Framing)

We expected expert entrepreneurs to think holistically about building a business rather than simply answering the questions in the scenario We counted the number of thoughts a

TABLE 3
Summary of Variable Descriptive Statistics, Interrater Agreement, and Analysis Results

Variable Description	Descriptive Statistics	PRL[a]	Entrepreneur/ Manager Difference	Entrepreneur/ Executive Difference	Summary of Findings on the Differences Between Expert Entrepreneurs and Managers
P_1 (Market Research)					
Market research	Expert 13 yes, 14 no Manager 34 yes, 3 no	81	$\chi^2 = 15\ 31$ $p < 001$	$\chi^2 = 11\ 63$ $p = 001$	Expert entrepreneurs are less likely to believe and accept market research than managers
P_2 (Prior Experience)					
Prior experience	Maximum 4 Minimum 0 SD 96	77	F = 20 89 $p < 001$	F = 11 01 $p = 002$	Expert entrepreneurs are more likely to draw on experience in uncertainty than managers
P_3 (Affordable Loss)					
Affordable loss	Maximum 10 Minimum 0 SD 2 57	69	F = 41 52 $p < 001$	F = 18 11 $p = 000$	Expert entrepreneurs are more concerned with project affordability than managers
P_4 (Decision Framing)					
Decision framing	Expert 21 yes, 4 no Manager 4 yes, 33 no	62	$\chi^2 = 29\ 41$ $p < 001$	$\chi^2 = 9\ 54$ $p = 004$	Expert entrepreneurs are more likely to think holistically about the business
Decision framing long-term	Maximum 12 Minimum 0 SD 1 77	78	F = 10 74 $p = 002$	F = 6 26 $p = 015$	Expert entrepreneurs are more likely to consider the long-term
P_5 (Market)					
Market and product	Maximum 8 Minimum 0 SD 1 38	82	F = 14 93 $p < 001$	F = 3 87 $p = 048$	Expert entrepreneurs identify or create more new markets than managers
P_6 (Price)					
Price qualitative	Expert 9 skim, 3 penetration Manager 1 skim, 11 penetration	77	$\chi^2 = 12\ 21$ $p = 002$	$\chi^2 = 46$ $p = 793$	Expert entrepreneurs are more likely to price high (skim) to maximize cash Managers are more likely to price low (penetration) to drive adoption
Price quantitative	Maximum $1,000 Minimum $30 SD $141	98	F = 4 19 $p = 046$	F = 62 $p = 435$	Expert entrepreneurs price product higher than managers
P_7 (Channel)					
Channel all direct sales	Expert 6 yes, 21 no Manager 8 yes, 29 no	75	$\chi^2 = 003$ $p = 954$	$\chi^2 = 2\ 24$ $p = 098$	No difference in direct sales channel choice between expert entrepreneurs and managers
Channel personal direct sales	Expert 3 yes, 3 no Manager 0 yes, 8 no	81	$\chi^2 = 5\ 09$ $p = 024$	$\chi^2 = 36$ $p = 455$	Expert entrepreneurs choosing direct sales are more likely than managers do it themselves
Channel partnerships	Maximum 3 Minimum 0 SD 73	86	F = 13 24 $p = 001$	F = 3 59 $p = 032$	Compared with managers, entrepreneur experts cocreate with distribution partners
Channel number of channels	Maximum 4 Minimum 0 SD 1 03	71	F = 29 $p = 864$	F = 21 $p = 646$	No difference between expert entrepreneurs and managers on number of channels
Channel number of segments	Maximum 4 Minimum 0 SD 1 02	75	F = 5 80 $p = 019$	F = 4 46 $p = 039$	Expert entrepreneurs are less likely to pursue more unique segments than managers

[a]PRL provides the proportional loss reduction measure of interrater agreement (Rust and Cooil 1994) for the variable
Notes Chi-square tests are two-tailed

participant offered that related to the business but were outside the scope of questions presented by the scenario to determine the degree to which participants went beyond the data to make decisions We found that expert entrepreneurs were significantly more likely to think holistically about the scenario ($p < 001$) than managers In further support of P_4, we also counted the number of thoughts a participant had about long-term issues regarding the business Because we did not ask about long-term issues, this also reflected the degree to which participants thought beyond the scenario and envisioned the business as a whole As we expected, expert entrepreneurs were significantly more likely ($p = 002$) to be concerned about long-term issues than managers In the following quotation, Expert Entrepreneur 25 references long-term issues and uses an analogy to trace a possible trajectory of how his venture would endure over time

> Again I'm looking at a long-term play here That market, if we were doing an analysis of institutional, instructional technology market and the interactive simulation market, let's go back and look at some examples The Apple computer is an excellent example of how you can come into a market, get great market play, and then blow out, for all the reasons I said I wanted to avoid I want to have flexibility, I want to be able to deal in multicultural situations, I want it in fact to be current—so that it doesn't become stale

P_5 (Market and Product)

We found that expert entrepreneurs were significantly more likely than managers to identify or pursue markets not mentioned in the Venturing product scenario ($p < 001$), even if that choice implied a change to the product articulated in the scenario, in support of P_5 The key to this difference was the way expert entrepreneurs chose to interact with stakeholders to redefine and transform the initial product Beginning with exactly the same hypothetical product, the 27 expert entrepreneurs created 28 different and unique market definitions with product adaptations to match Conversely, the 37 managers were less likely to reformulate the concept of the market, generating only 12 new market definitions

Furthermore, expert entrepreneurs were more open to considering new markets at least in part because they were not as tied to the articulation of the product as presented in the scenario Although we could not find a reliable way to operationalize this difference quantitatively, we present three quotations from expert entrepreneurs that reflect their willingness to make product changes, enabling them to consider new market definitions

> Expert Entrepreneur 6 Find out actually who your customers are, and from that, you might change your advertising approach and change the design of the product

> Expert Entrepreneur 11 Find out how the training operations of larger companies, how they inform themselves about what kind of courses they can offer, and the decision process they go through, and the kind of criteria they set in terms of what a product of this nature should look like

> Expert Entrepreneur 18 One of the ways I find that you get buy-in to anything is to make the potential customer feel that they have a part in developing the product

These quotations illustrate three mechanisms expert entrepreneurs use to reconceptualize product in uncertain situations customers, process, and partners Other mechanisms may be at work as well We do not attempt to determine exhaustively all possible mechanisms and their potential relationship to the reconsideration of target markets and products here, instead, we offer this as a potential avenue for further research

P_6 (Price)

To examine the initial price preferences of expert entrepreneurs and managers with less entrepreneurial experience, we first looked for explicit strategy remarks about pricing decisions We identified statements that reflected a strategy of pricing high to maximize profit and coded these as skim strategies We also identified statements that reflected a strategy of pricing low to drive early product adoption and coded these as penetration strategies We found that expert entrepreneurs were significantly more likely to base pricing decisions on a skim pricing strategy and that managers were significantly more likely to base pricing decisions on a penetration pricing strategy ($p = 002$) This significant difference was evident in the quantitative prices as well ($p = 046$), for which the mean expert entrepreneur price was \$157 and the mean manager price was \$75, in support of P_6 We present two quotations one from Manager 3, who discussed setting penetration pricing for a market share, and one from Expert Entrepreneur 3, who articulated entry with a skim strategy

> Manager 3 I think that probably given the primary data, [I'd] probably price it in the \$50 to \$100 range I would want to get a higher percentage of people at first to be able to take, especially if it is offered through the Internet initially You have got to be able to keep the price down to get people interested

> Expert Entrepreneur 3 All the traffic will bear, no question you are going to charge as much as you can, looking for the inflection point on the curve as to when you're going to get the higher volumes Sometimes it pays to try to figure out a two tier pricing, so you have the platinum game and you have the B-average game in some form or another

P_7 (Channel)

To analyze channel choice, we began by coding all channel strategies according to the categories in Table 2 To determine whether a participant based channel strategy around an individual customer or a whole segment, we considered the channel in which either choice was viable—namely, direct sales We first examined the difference between expert entrepreneurs and managers with less entrepreneurial experience on their predisposition toward direct selling in general and found no significant difference ($p = 954$) Considering only participants who chose to sell direct, we analyzed thoughts describing a strategy that involved the founder doing the initial selling The difference between the groups on a strategy of personal, direct selling showed that expert entrepreneurs were significantly more likely to make initial sales themselves, while managers were more likely to engage a sales force to approach a segment ($p = 024$) We provide an example in which Expert Entrepreneur 10 articulates a personal, direct selling strategy and an example in which Manager 7 excludes direct customer contact in all three selected channel alternatives (direct, Internet, and retail)

> Expert Entrepreneur 10 Because I figured since I'm here in Boston and we have a really fantastic environment to create feedback, where I personally can be involved rather than have to get it translated through some kind of representative
>
> Manager 7 The educators, yeah, I would have to, you would have to rely mostly on recruiting and sales guys to go around and hit up the school boards Definitely the Internet and the retailers to get the direct end user customers, especially the Internet would probably be somewhere you find the 19- to 25-year-olds You would have to hire the recruiters and the Internet and the retailers

Further support of P_7 is offered by our analysis of differences in how expert entrepreneurs and managers use partnerships We counted the number of thoughts related to partnership activities and found that expert entrepreneurs were significantly (p = 001) more likely to incorporate partnerships into their decision making as they solved problems during the scenario Although we did not find any significant difference between the groups with respect to the number of channels chosen (p = 864), we found that managers were significantly more likely to select more segments than expert entrepreneurs (p = 019) In summary, we find a majority of support for the components of P_7, except for the number of channels chosen

To summarize the results, expert entrepreneurs are significantly more likely to use heuristics based on an effectual logic in making marketing decisions under uncertainty In contrast, managers with little entrepreneurial experience tend to rely on predictive approaches prescribed in marketing textbooks

Implications and Conclusion

Effectual logic provides an internally consistent set of prescriptions for marketing decision making under uncertainty (see Table 1), which contrast significantly with marketing textbook prescriptions In all fairness, however, we must acknowledge at least two issues in interpreting this evidence (1) Most, if not all, textbook prescriptions are derived from studies of marketing within large, well-established corporations and not in entrepreneurial settings, and (2) there are several strong movements in marketing scholarship away from the old dominant logic underlying textbook prescriptions and toward exactly the sort of principles and heuristics advocated by an effectual logic[5] We outline a few of these and discuss one in particular

Effectual Logic: Coherence with Cocreational Theories of Marketing

In a foreword to the recent book edited by Vargo and Lusch (2006), Webster (p xiii) avers the following

> For the past decade or so, marketing thought leaders, both in academe and business, have expressed increasing concerns about the state of marketing, both as a science and as a practice, and the strained relationship between the two There is more agreement about the nature of the problems facing the field than there is about required changes and future direction

In the ensuing discussion, we keep in mind the ongoing and unfinished nature of this conversation and offer our contributions as exciting possibilities for profitable collaboration with the works in progress on entrepreneurial effectuation rather than as competing, alternative theories Expert entrepreneurs' use of effectual logic both coheres with and lends credence to several recent insights from marketing and the resultant angst toward the field In a nutshell, effectual logic is relational (Arndt 1979, Dwyer, Schurr, and Oh 1987, Macneil 1980, Morgan and Hunt 1994), network oriented (Achrol and Kotler 1999), equity driven (Rust, Lemon, and Zeithaml 2004), and cocreational (Jaworski and Kohli 2006) In line with Vargo and Lusch (2004), effectual logic is also human centered and operant resource based

Hunt and Morgan (1997) identify a large slate of resources, including both operand and operant resources, and posit the resource-advantage theory as a candidate for a general theory of competition Resource-advantage theory is a close cousin of the resource-based view (RBV) in strategic management In many ways, effectual logic is indeed resource based, but it differs from both the RBV and the resource-advantage theory in important ways Recently, the RBV has come under criticism because it uses "valuable" as one of the characteristics that defines a resource[6] Resource-advantage theory appears to be susceptible to a similar critique For example, consider Hunt and Madhavaram's (2006, p 100) definition "A firm resource is any tangible or intangible entity available to the firm that enables it to produce efficiently and/or effectively a market offering that has value for some market segment(s) " This is dangerously close to being fodder for the criticism "that bad marketing is also marketing" (Levy 2006, p 62) Effectual logic attempts to sidestep this problem by explicitly assuming any and all means at hand—regardless of whether they turn out to be valuable *ex post*—as possible inputs into the process For example, new ventures frequently use waste or slack resources (i e , those perceived as having little or no economic value, such as the time and effort of stay-at-home mothers in the case of Mary Kay Cosmetics) as key operant resources to develop new business models More recently "waste equals food" has become a mantra for environmentally-friendly ventures inside and outside corporations (McDonough and Braungart 2000) The emphasis in entrepreneurial effectuation is really on what the effectuator does with the means at hand rather than any value, potential or otherwise, embodied in the resources themselves, whether operand or operant In this, the effectual RBV is procedural rather than substantive

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[5] At the same time, neither uncertainty nor entrepreneurship is afforded much mind space, even in the conversation about the evolution of a new dominant logic for marketing For example, these two words did not even make it into the subject index in Vargo and Lusch's (2006) book, and the only mention of either we found was contained in the quotation at the beginning of this article

[6] For example, note the dialog between Barney (1991) and Priem and Butler (2001) published in the *Academy of Management Review* (see also Hunt and Madhavaram 2006)

Resource-advantage theory, similar to its cousin RBV, posits relationships between a firm's resources and its position in the competitive landscape Dynamism enters into the landscape as firms struggle to obtain resources that are either unique or relatively difficult to imitate or move and therefore serve as sources of sustainable competitive advantages As Hunt and Morgan (2006, p 72) note, "[Competition] consists of the constant struggle among firms for comparative advantages in resources that will yield market positions of competitive advantage and thereby, superior financial performance"

In effectuation, in addition to the resources that might have such long-term potential, what people do with the resources matter Therefore, the effectual process itself can make any given resource more or less valuable and more or less capable of producing long-term advantages For example, consider the case of coffee before the appearance of Starbucks As Koehn (2001) chronicles, coffee was considered a commodity in the late 1970s, for which prices had been going down for more than two decades However, through the actions of a handful of entrepreneurs and their early stakeholders, an entire new industry of specialty coffee was cocreated, greatly enhancing the value of coffee and transforming it from a basic commodity to a premium consumer experience This argument about the process of cocreating new value is just as applicable to that most important of operant resources—the human being Entrepreneurs throughout history (sometimes out of societal concerns but more often out of economic necessity or opportunity) have invested in and improved the value of human resources As Koehn (1997, p 44) writes of Josiah Wedgwood as early as the eighteenth century,

> The task was to make artists of mere men It made no sense to rely on the local labor market because "few hands can be got to paint the flowers in the style we want them" I may add, nor any other work we do We must make them There is no other way

Expert entrepreneurs do not consider resource value exogenous to the cocreation process They are well aware that cocreation provides financial and psychological ownership to all stakeholders engaged in the process and often ends up making even mundane resources more valuable In the age of the World Wide Web, this has become inescapable, customers of firms such as Netscape, Google, and Amazon com literally purchased equity to make them blockbuster initial public offerings The phenomena of open source and crowd-sourcing offer further testaments to the notion that cocreation increases the value of the resources of the firm, be it share value, brand value, or the social and reputational value of its intangible resources Effectuators explicitly embrace and leverage this endogeneity of resource value to the dynamics of the cocreational process Here, it is the cooperative shaping of the market rather than a competitive scramble for (predicted to be) valuable resources that drives industry dynamics

In this connection, effectual expertise poses a nuanced but important challenge to an unstated assumption in current marketing theorizing that may be worth highlighting cocreation not only with customers and suppliers but also with a variety of other stakeholders Common to almost all current marketing research, including the recent collection of articles in Vargo and Lusch (2006), is the existence of a class of people exclusively called "customers" Marketing scholars tend to ignore or, in some cases, assume away the notion that customers may play multiple or ambiguous roles (i e , they may also be investors or suppliers or may not themselves know if they are or want to be customers at all)

By focusing on a cocreation process that includes any and all people as potential stakeholders and allows negotiation and renegotiation between self-selected stakeholders as the way to determine subsequent roles and relationships in the growing network, effectuation offers a practical process for tackling both role and goal ambiguities in value cocreation This implies that it may be profitable for researchers to consider how they might generalize marketing insights to stakeholders as a whole In a recent article on managing the cocreation process, Payne, Storbacka, and Frow (2008, p 94) echo this call for further research on "the role of nonsupplier partners and intermediaries in co-creation"

In conclusion, although the exact nature and extent of effectuation's contribution to the development of a new paradigm in marketing is an empirical question, there is a prima facie case for considering its theoretical contribution to the field In addition, there are significant managerial implications

Managerial Implications

Here, we return to the marketing student knocking on the professor's door and consider how we should respond to the question of designing winning strategies under uncertainty Note that the use of effectual logic is neither a necessary nor a sufficient condition for achieving marketing or entrepreneurial success Yet the findings from the current study are not without normative implications for performance

The findings regarding market research and pricing are particularly striking in this regard Not only are the specific heuristics addressing market research and pricing consistent with a relational and cocreational, rather than a transactional, view of marketing, but they also provide distinct mechanisms for keeping costs down and pushing revenues up Therefore, regardless of any exogenous probability of success or failure, they work in the directions we would want them to work with regard to endogenous variables Moreover, when we take into account that cocreational and nonpredictive aspects of effectuation tend to endogenize more variables than traditional approaches that take those variables as exogenous, there is room for optimism in terms of our pedagogical and practical recommendations

Market research Our finding that expert entrepreneurs are skeptical of market research suggests that marketing managers facing uncertainty should fully consider the value of alternatives to conventional market research activities Expert entrepreneurs replace market research with cocreational or partnership strategies with potential customers, suppliers, and investors who they work with directly They view all four Ps as iterative and interactive outcomes of a cocreational process driven by self-selected stakeholders that include customers We speculate that this process generates several implications

First, by interacting with and "listening in" (Urban and Hauser 2004) to specific stakeholders, not only are companies in the initial stages of new market, product, and service development more likely to generate novel information, but the kind of information they generate is also more likely to be useful and valuable Compared with traditional market research, this increases the likelihood of creating realistic new market opportunities because firms learn at every step what stakeholders will actually commit to and—just as important—what they will not commit to This enables the firm to fail fast on poor product and service ideas and to bring good ideas to market sooner

Second, rather than investing time, money, and managerial effort up front in market research, new ventures can move directly to selling a potential or actual product or service to customers on the basis of affordable loss Here again, an implication is faster feedback at lower cost than market research activity would typically enable Furthermore, in many instances, stakeholders may pay for or contribute to the costs of creating the early-stage product or service, which distributes risk and cost among stakeholders, thus lowering both to the new venture Finally, to the extent that each stakeholder also invests only what he or she can afford to lose, the firm may be able to carry out more iterations of the product or service development process, thus increasing experimentation and consequent generation of valuable novelty at lower cost

Pricing No strategy probably dominates start-ups run by managers with little entrepreneurial experience more than promising customers "more for less"—that is, more valuable products and services at lower prices This conjecture is borne out in our study, such managers consistently price lower than expert entrepreneurs Expert entrepreneurs have learned that more for less is not a good pricing strategy for new products and services We speculate that this has several implications for practicing managers

First, in the case of new or uncertain product/service offerings, customers are not likely to have been exposed to prior price information The initial pricing for a new product or service will act as a reference for the niche (Mazumdar, Raj, and Sinha 2005) Using a negotiated pricing process (rather than predictive pricing) is more likely to result in new ventures establishing an accurate range for a high reference price that customers still perceive as fair (Bolton and Lemon 1999)

Second, by directly negotiating with early customers and achieving bidirectionality and mutual satisfaction in pricing decisions (Oliver 2006), the company locks in customer commitment not only to the value proposition but also to the new venture itself, thereby increasing the probability that customers will become repeat purchasers and perhaps active promoters of the company's offerings (Bendapudi and Leone 2003)

Further Research

Before we conclude the article on a high note, it would be worthwhile to specify certain limitations and contingencies on the use and misuse of effectual logic Because this study is an early step in understanding effectuation, rather than speculating on where these boundaries may lie, we tackle these through an examination of future research possibilities

One of our core findings suggests that expert entrepreneurs are skeptical of market research A limitation of our study is that we did not examine the moderating effects of variables such as product type, customer target, or competitive intensity Further research might examine the conditions and approaches in which market research improves new venture success For example, although market research is not positively correlated to performance for radical innovation, it may be beneficial for entrepreneurs to conduct market research if the new firm is creating incremental products that meet existing market needs Furthermore, although assessing segment size may be useful to a new venture that intends to offer a mass-produced standard product, it may be irrelevant to a new service venture that can customize each and every engagement

Further research could also investigate effective strategies and targets for cocreation For example, although much literature has examined funding partners, a critical supplier may be a more important cocreation partner for a new venture, which typically lacks both resources and expertise (Song and DiBenedetto 2008) Suppliers that are involved early in the product design, testing, and commercialization phases can make early investments in equipment, tools, and training, can identify design errors early on, can observe what works and what does not, and will be aware of the market launch and product positioning strategy from the outset However, the new venture also lacks prior experience with potential suppliers and thus may not necessarily be a desirable partner from the supplier's point of view How can the new venture with no prior relationships gain commitments from a key supplier in the cocreation process? Further research might usefully unpack the complex and integrative nature of precommitments and cocreational relationships

Conclusion

We have shown a relationship between expert entrepreneurs and unique, effectual approaches to decision making under uncertainty that is not evident in their manager peers This is relevant because virtually all categories of products and services now modeled, analyzed, and predicted were once novel and uncertain Even predictable markets can change abruptly as a result of disruptive inventions, regulatory actions, and events outside the control of even the best marketers From our work, we extracted some common decision strategies of expert entrepreneurs faced with uncertain business problems and, from these findings, made inferences to aid our understanding about the genesis of products, firms, and markets

In summary, effectual logic not only overlaps with the ways marketing theories are evolving but also brings texture to the entrepreneurial spirit of marketing. Marketing is central to creating valuable new ventures both at the level of individual stakeholders in the firm and for the economy and society as a whole. Yet scholarship in entrepreneurial finance is better developed than research at the interface of entrepreneurship and marketing. Furthermore, marketing as a science finds itself in exciting times, caught up in the heady vortex of developing a new dominant paradigm. Perhaps a more detailed understanding of how expert entrepreneurs make marketing decisions will help coalesce some of the elements of the new paradigm. The results from the current study relating effectual logic to marketing under uncertainty hark back to the quotation from Vargo and Lusch (2006, p. 53) at the beginning of this article: "In this sense, one of the most important operant resources in society and the economy is the entrepreneurial spirit."

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Barak Libai, Eitan Muller, & Renana Peres

The Role of Within-Brand and Cross-Brand Communications in Competitive Growth

Consumer-generated communication processes have drawn increasing attention of marketers and researchers However, an underresearched issue is that interpersonal communications are not always brand specific Thus, a person can adopt a brand either as a result of communication with adopters of that brand (within-brand influence) or as a result of an interaction with adopters of competing brands (cross-brand influence) This study shows that the interplay between within- and cross-brand influence can have a substantial effect on the growth of markets under competition The authors develop a model that explicitly represents these two influences and focus on the case of two otherwise identical competing brands with different entry times As a result of within-brand influence, current customers create an interaction-based advantage for the first entrant, which grows with time Thus, we illustrate how customers should be viewed as market assets who yield increasing returns during the diffusion process Conversely, cross-brand influence enables a market follower to enjoy a shorter takeoff time Given the combination of both, the authors predict the "dual pattern," characterized by a fast takeoff for a follower, followed by a widening gap in favor of the first entrant, all else being equal They show that such a pattern dominated the market growth of the cellular industry in Western Europe They explain the reasons behind this dual pattern, rule out straightforward alternative explanations, and discuss the managerial implications

Keywords word of mouth, brand management, diffusion of innovations, cellular/mobile, elecommunications, pioneering advantage

A major product introduction in the United States in 2007 was Apple's launch of the iPhone Close observation of the introduction yields two key inferences First, the promotion of iPhone was heavily tilted toward word-of-mouth communications and buzz instead of paid advertising (Reuters 2007, Word-of-Mouth Marketing Association [WOMMA] 2007) Second, following Apple's launch, several leading handset manufacturers, such as Samsung and Nokia, began launching smart phones with similar features (Yoon 2007) The market's internal communication dynamics in this case might lead a person to wonder about the extent to which communication is specifically related to iPhone and, thus, the extent to which competitors are enjoying the buzz generated by iPhone While Apple is working under the assumption that interpersonal communication will help push its own product, allowing it a relatively low investment in advertising, others in the industry are enjoying the benefits of this cross-brand effect To quote Verizon spokesperson Michael Murphy, "I would have to think that a rising tide lifts all ships" (Reuters 2007)

Although consumer-based communication processes are occupying increasing interest from academics and practitioners (Rosen 2000, WOMMA 2006), a notable but often overlooked issue is that the terms "word of mouth" and, more generally, "interpersonal communications" are not always brand specific Potential adopters can communicate with the customers of a specific brand but eventually purchase a competing brand as a result of factors such as brand equity, price, availability, special offers, and a better match to their needs

In line with this distinction, a firm may identify two sources of communications influence that constitute the focus of this study "within-brand influence," which originates with the firm's own customers, and "cross-brand influence," which originates with the customers of the firm's competitors The latter describes communications disseminated by competitors' customers that eventually translate into the purchase of the focal brand The distinction between within-brand and cross-brand influence has not been explored in the market growth literature The Bass model and its extensions, which have been the main thrust of academic market growth modeling, have mostly focused on the category level (Mahajan, Muller, and Bass 1990,

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Mahajan, Muller, and Wind 2000). Although some efforts have been invested in modeling diffusion at the brand level (Krishnan, Bass, and Kumar 2000; Parker and Gatignon 1994; Peterson and Mahajan 1978; Shankar, Carpenter, and Krishnamurthi 1998), the interplay between communications effects that stems from the brand's own customers versus that of the competitors' customers has not yet been probed. In this study, we present a brand-level growth model that explicitly accounts for both within-brand and cross-brand influences and their effect on growth of competitive markets. Our main findings include the following:

- *The rapid takeoff of the follower*: For similar brands entering in different periods, a later entrant often enjoys a faster and sharper takeoff than the first entrant. The reason is that the follower benefits from the cross-brand influence of the first entrant's customers, an advantage that the first entrant did not have in its early days as a monopoly. This finding lends a brand-level perspective to the new product takeoff literature, which in general has focused on the category level (Golder and Tellis 1997; Tellis, Stremersch, and Yin 2003). We show that in addition to the economical and cultural factors investigated so far, brand-level takeoff depends on competitive position and communication dynamics in the market.
- *The "interaction-based advantage" of the first entrant*: As a result of within-brand influence, the customers acquired by the first entrant become a source of a self-reinforcing competitive advantage. Because, when competition enters, the first entrant has more customers than a later entrant, it can expect more brand-specific interactions and, thus, more new customers per period, who in turn generate more communications. We show that for similar brands, this becomes an "increasing return" process that widens the gap between the first entrant and a follower. We label this source of pioneering advantage as an "interaction-based advantage." Given these forces, the interplay between within-brand and cross-brand communications generates a dual pattern of growth—that is, a faster takeoff of the follower but an increasing advantage to the first entrant, all else being equal. We show how the exact nature of this dual pattern depends on the relative strength of within- and cross-brand dynamics.
- *No need for perceptual difference*: The focus on similar brands is central to our analysis because it distinguishes the interaction-based advantage from previously identified sources of pioneering advantage and disadvantage that had been attributed to some perceived brand difference. In contrast, we show that even without any difference in perceived value among the brands, the within- and cross-brand influences will produce a differential growth pattern based on entry time. In this sense, the dual pattern is a fundamental aspect of the growth process that affects competitive growth regardless of specific brand-related idiosyncrasy. However, note that brands entering at different points might not be perceived as similar, in which case the interaction-based advantage will be just one of the factors that eventually create the differential sales pattern. We still find that for the later entrant to eventually overcome the interaction-based advantage of the pioneer, its growth parameters must be considerably larger than that of the pioneer (twice as large on average in our simulations).
- *Dual pattern prevalence in cellular markets*: To investigate the dual pattern empirically, markets with relatively similar brands would help control for effects stemming from brand difference. We examined the cellular phone markets in Western Europe, in which regulatory effects created a relatively similar brand environment. Indeed, we identified the dual pattern in 14 of 16 Western European countries. We use these brand-level data to show that the ratio of within- to cross-brand influence explains the dual pattern better than other, more straightforward alternatives, such as differences in price, churn, and technology.

We organize the rest of the article as follows: Next, we present the brand-level growth model and then demonstrate analytically the dual pattern. Then, we examine the dual pattern in the case of the Western European cellular market and show how the growth pattern in various countries can be explained by both within-brand and cross-brand dynamics. We then explore and question several alternative explanations for the dual pattern and conclude with the implications of our findings.

Cross-Brand and Within-Brand Influence

The premise of this article is that the growth of a competitive brand can be affected by the interplay between sources of information for prospective adopters: the brand's own users, who provide a within-brand effect, and the competitor's users, who provide a cross-brand effect. Our focus is on describing the aggregate influence of these effects rather than the communication processes and decision making on the part of the individual consumer. However, before we model the aggregate outcome of these effects, we briefly discuss the possible mechanisms that can generate these two types of influence.

An examination of the communication processes between adopters of a brand and prospective adopters suggests that they can be classified into brand-level and category-level communications. The term "communication" may include word of mouth as well as other nonverbal imitation processes that are part of the contagion process associated with new products (Van den Bulte and Lilien 2001). However, utility-related contagion, such as network externalities, is not considered under communication; we discuss this in greater detail subsequently.

Brand-level communication is specific to the characteristics of the brand. In the iPhone case, the specific virtues of iPhone would be the subject of communication. This phenomenon is typically presented in the business press to motivate managers to invest in customer satisfaction (Pruden and Vavra 2004; Reichheld 2006). Category-level communication is about the category as a whole and affects the adoption decision of the product category. In the iPhone example, such communication would be about the smart phone category. The research literature implies evidence of category-level effects generated by users of brands in the category. That is, consumers often use information on specific brands to generalize to new products in the category and make inferences from category-level information on specific brands in the category (e.g., Meyers-Levy and Sternthal 1993). The decision regarding the specific brand eventually purchased may depend on other factors, including brand equity, price, and availability. For electronic appliances, for example, interpersonal communications often affect the adoption at the category level, while the final decision is made later, based on issues such as price, convenience, or brand equity of a specific brand (Gardyn 2003)

The distinction between category- and brand-level effects has been examined in the marketing literature on topics such as positioning strategies (Sujan and Bettman 1989), consumer choice (Nair, Dubé, and Chintagunta 2005), third-party recommendations (Shaffer and Zettelmeyer 2002), and advertising effects (Bass et al 2005, Chakravarti and Janiszewski 2004) Yet a similar investigation has not been conducted on the different types of interpersonal communications and their respective effects on market dynamics However, relevant behavioral research suggests that communications effects work at both the category and the brand levels and that the extent to which information on one brand affects consumer perception of other brands depends on factors such as the similarity between the brands and the nature of the decision-making process (Grewal, Cline, and Davies 2003)

The translation of brand- and category-level communications into within- and cross-brand influences can occur in multiple ways Consider a user of Brand A who communicates with a prospective adopter about the product Usually, positive brand-level communication leads to the purchase of the same brand Brand-level communication can also lead to the eventual purchase of a competing brand (Brand B) This can happen in the case of category-level communications or, alternatively, with negative word of mouth The latter case may be a less common case across categories because brand owners' positive word of mouth is more common than negative word of mouth (East, Hammond, and Wright 2007) Category-level communication influences the adoption decision of the category, which in turn translates into the purchase of either Brand A or Brand B Thus, the decision to adopt Brand A can occur as a result of both category- and brand-level communications, and Brand A can gain users as a result of both its own users and the users of the competing brands

The translation of category- and brand-level communications into cross- and within-brand influences is a promising area of research, most likely demanding individual-level data This transformation depends on several factors, such as brand equity, price, or the extent of perceived similarity among brands In some cases, decision making may be described by a two-stage process, in which the consumer first adopts the category and then decides on the brand Here, a nested logit analysis may be necessary

Modeling the Effect of Within- and Cross-Brand Communications on Growth

Consider a growing market for a new product, with multiple similar competing brands in the same category We follow recent brand growth models (e g , Krishnan, Bass, and Kumar 2000) and assume a common pool of potential adopters for the various brands An alternative is to assume that each brand has its own unique market potential, such as in the pioneering work of Peterson and Mahajan (1978) and in some later works (Mahajan, Sharma, and Buzzell 1993, Shankar, Carpenter, and Krishnamurthi 1998) This assumption may fit a case in which brands differ so widely that they focus on discrete consumer pools, yet it is less suited to the case of similar brands in the same category

Although the new product growth modeling literature has focused mostly on the category level, marketing modelers increasingly use diffusion models to study the growth of competitive markets, thus, we use a diffusion framework and define the following variables and parameters

$N_i(t)$ = number of adopters of brand i at time t,
$N(t)$ = total number of adopters at time t—that is, $N(t) = \Sigma_i N_i(t)$,
m = common market potential,
p_i = parameter of external influence for brand i,
q_i = within-brand influence on brand i, and
q_{ij} = cross-brand influence of brand j on brand i

The equations that govern the growth of brand i in a multibrand market are given by the following Bass-type equation set (for the two-player case, see Savin and Terwiesch 2005)

$$\text{(1)} \qquad \frac{dN_i(t)}{dt} = \left[p_i + \frac{q_i N_i(t)}{m} + \sum_{j \neq i} \frac{q_{ij} N_j(t)}{m}\right](m - N)$$

Adopters of brand i (N_i) spread brand-level communications by contacting and converting nonadopters ($m - N$) at a rate of q_i to adopt brand i In addition, because of cross-brand influence, adopters of the competing brands j contact and convert nonadopters ($m - N$) to adopt brand i at a rate of q_{ij} Thus, a potential adopter adopts brand i as a result of the combination of within-brand communications from the customers of brand i and cross-brand communications from the adopters of the competing brands j Note that the cross-brand communications spread by the adopters of brand i are counted in the corresponding equations of the competing brands j, as are the brand-level communications spread by adopters of brands j Note also that consistent with much of the diffusion literature, we do not explicitly model negative word of mouth if it exists but rather regard the overall resultant influence of each brand's customers (for modeling negative communications, see Goldenberg et al 2007)

This equation generalizes other models that describe competitive growth When $q_i = q_{ij}$—that is, when within-brand influence is equal to cross-brand influence—the model is similar to that of Krishnan, Bass, and Kumar (2000), that of Kim, Bridges, and Srivastava (1999), the basic model of Givon, Mahajan, and Muller (1995), and one of the five models of Parker and Gatignon (1994) The underlying assumption is that there is no relevance to the brand ownership of the person who spreads the communications However, if $q_{ij} = 0$, only within-brand influence is present, and the model is similar to that of Kalish, Mahajan, and Muller (1995), another model of Parker and Gatignon (1994), and that of Mahajan, Sharma, and Buzzell (1993) In most cases, however, both cross-brand and within-brand influences can be expected, and their respective magnitudes may not necessarily be equal This approach was recently taken by Savin and Terwiesch (2005), who examined analytically optimal entry time in a duopoly market Among their findings was that optimal entry time depends on the ratio of cross-brand to within-brand influence Note also that the interpretation of the growth parameters as communications parameters is well established in marketing

Similar Brands, Different Entry Times

The model in Equation 1 can be used to explore various research questions, such as investment in marketing resources, the influence of brand characteristics on growth, and optimal entry times One scenario of interest is the dynamics of a market with a first entrant and a follower As we demonstrate shortly, this case, in addition to being common in many markets and industries, illustrates well the differential effects of cross- and within-brand influence on market growth Competitive dynamics themselves may generate a perceptual difference in the two brands, either because of an actual difference or because of the entry time perceptual effects (Golder and Tellis 1993, Kerin, Varadarajan, and Peterson 1992) This will be captured in the difference in the diffusion parameters q_i and p_i for brand i in Equation 1 Because we want to isolate the effects of cross-brand and within-brand influence, respectively, and not deal with perceived differences that have been considered elsewhere, we focus on the case of two brands that are similar in both their product- and brand-related attributes, thus, we assume that $q_i = q_j = q$ and that $q_{ij} = q_{ji}$ and $p_i = p_j$

Without loss of generality, we assume that firm i was first to market and that firm j joined at time t_0, so that the initial conditions are $N_i(t_0) = N_0$, $N_j(t_0) = 0$ Under these conditions and because we know that the category-level solution is a Bass function, the model can be solved analytically to yield the following for $p_i = p_j$ (for the more general case where $p_i \neq p_j$, see Web Appendix A at http //www marketingpower com/jmmay09)

$$(2)\qquad N_k(t) = (m/2)\frac{S - e^{-(P+Q)t}}{S + (Q/P)e^{-(P+Q)t}} + (-1)^{k+1} m \frac{\left(S + Q/P\right)^{\alpha - 1}(S-1)/2}{\left[S + (Q/P)e^{-(P+Q)t}\right]^{\alpha}},$$

where k receives the value of 1 for the pioneer and 2 for the follower, $P = p_i + p_j$

$$Q = q + q_{ij},\ S = \frac{m + (Q/P)N_0}{m - N_0},\ \alpha = \frac{q - q_{ij}}{q + q_{ij}}$$

The first term of Equation 2 is the Bass function with nonzero initial condition Parameter S represents the effect of the additional initial seed of adopters, which Muller, Peres, and Mahajan (2007) call the "seeding factor" The second part of Equation 2 is added to the first entrant and is subtracted from the follower, representing the asymmetry in initial conditions Summing up Equation 2 for both firms yields the Bass equation with nonzero initial conditions

The Interaction-Based Advantage of the First Entrant

We now turn to examining the dynamics of the difference in number of users between the first entrant and the follower for similar brands We define the gap between the firms as the difference in the number of customers between the first entrant and the follower, or $N_i(t) - N_j(t)$ To understand how the gap changes with time, we take the derivative of the difference between the number of customers of the first entrant and that of the follower From Equation 1, we obtain the following

$$(3)\qquad \frac{dN_i(t)}{dt} - \frac{dN_j(t)}{dt} = (q - q_{ij})\left[N_i(t) - N_j(t)\right]\left[m - N(t)\right]$$

Note that Equation 2 implies that at any given point in time, $N_i(t) > N_j(t)$ Assume now that the intensity of within-brand influence is stronger than that of cross-brand influence ($q > q_{ij}$) Because all parts of the right-hand side of Equation 3 are positive, the derivative is positive, which means that the gap grows with time Therefore, we can state the following

P_1 When within-brand communication is more intense than the cross-brand influence ($q > q_{ij}$), the gap between the first entrant and the follower grows over time

As we discussed previously, because it is expected that in actual markets, and in the presence of positive communications, within-brand communication is more intense than that of cross-brand influence, we expect that the growing gap prevails in the case of similar brands We label this phenomenon the "interaction-based advantage" of the first entrant To understand the intuition behind the interaction-based advantage, we consider the point of competition entry The first entrant has N_0 customers, acquired during its time as a monopoly, while the follower has zero customers at entry This initial core group of the first entrant's customers generates both within-brand communications, which favor the first entrant, and cross-brand communications, which assist the follower Because the within-brand communications are stronger than the cross-brand communications, the first entrant, which initially has more customers, will acquire more new customers in subsequent periods, customers who, in turn, disseminate communications, which in turn reinforces the initial advantage Thus, the initial bulk of N_0 customers forms an increasing return asset to the first entrant

The Dual Pattern

To describe the full pattern of competitive growth under communications effects, we need to examine not only the dynamics of adoption over time but also the point of entry of the follower Thus, we examine the initial rate of adoption for the follower and compare it with that of the first entrant Formally, we compare the initial slope of each entrant's growth curve According to Equation 1, the initial slope of the first entrant at its time of entry ($t = 0$) is given by pm, while the initial slope of the late entrant at its time of entry ($t = t_0$) is given by $(p + q_{ij}N_0/m)(m - N_0)$, where N_0 is the number of the first entrant's customers at the time of competition entry A straightforward computation shows that if $p < q_{ij}(1 - N_0/m)$, the initial slope of the late entrant $N_j(t)$ will be steeper than that of the first entrant, $N_i(t)$

It follows that the initial growth of the follower is faster than that of the first entrant, as long as two conditions are satisfied First, the level of the external influence parameter must be lower than that of cross-brand influence Although empirical data on cross-brand communications are not available, our empirical analysis suggests that, on average, the level of cross-brand internal effect (q_{ij}) is stronger than that of the external influence for the follower (p_j) In a more general sense, diffusion internal influence parameters are considerably larger than external influence ones (Mahajan, Muller, and Wind 2000) Thus, this outcome can be expected

The second condition is that the follower must enter the market early enough, in which case ($1 - N_0/m$) is large enough Note that N_0/m is the percentage of the long-term market potential captured by the pioneer when the follower enters In the data we present next for the Western European cellular market, the average of N_0/m across 16 countries is estimated at 7% Data from other studies also suggest that rarely did the pioneer capture a considerable portion of the market potential before the competition entered (Golder and Tellis 1993, Srinivasan, Lilien, and Rangaswamy 2004)

Thus, because of the expected size difference between external and internal influence parameters, the external influence parameter of the later entrant p_j may indeed be frequently lower than a multiplication of q_{ij} by a number not much lower than 1, and this will satisfy the condition for the shorter takeoff time of the follower

> P_2 If the cross-brand communication influence is stronger than the external influence and the follower enters the market early enough, its initial growth will be faster than that of the first entrant

To understand the rationale behind this proposition, note that when the follower enters the market, two forces initially shape its growth compared with the first entrant On the one hand, the follower can enjoy cross-brand influence from the first entrant, thus providing an advantage over the first entrant, which had no other brand from which to draw influence On the other hand, the market potential is not as large as it was when the first entrant entered, thus diminishing the effect of both cross-brand and within-brand influences So, if cross-brand influence is strong enough and entry is early enough, the initial adoption rate for the follower is higher

From P_1 and P_2, when the follower enters the market early enough, we can expect a pattern of initial high growth for the follower but a growing gap in favor of the first entrant, all else being equal We label this pattern "the dual pattern" Such a combination of opposing effects can be a source of misinterpretation for managers and industry analysts if the early rise of a second entrant is interpreted as an indication of future takeover of the market because it may only be part of a pattern that eventually leads to the first entrant getting stronger

Will the Follower Become the Market Leader?

The interaction-based advantage we noted may be just one source of advantage or disadvantage of market players There are many examples in which pioneers did not survive in the long run or at least lost their market leadership (Golder and Tellis 1993, Srinivasan, Lilien, and Rangaswamy 2004) and theoretical reasons to believe that later entrants will sometimes have an advantage—for example, because their technology is perceived as superior (Bohlmann, Golder, and Mitra 2002) Our approach does not imply that later entrants cannot eventually become the market leader in terms of sales In Equation 2 and the subsequent analysis, we focus on markets for similar brands so that we can highlight the within-brand and cross-brand communication effects separately from other effects However, the basic model, as presented in Equation 1, allows the communication parameters p and q for each brand to differ, reflecting a possible difference among the brands If the later product is perceived as superior, it can eventually become the market leader, consistent with the many examples of the eventual market leadership of a latecomer (Golder and Tellis 1993)

However, to become the market leader, or at least close the gap, a superior latecomer must overcome the interaction-based advantage that still exists as a result of the within-brand effect of the pioneer How large should the perceived quality difference be for the follower to overcome the interaction-based advantage of the pioneer? Although this question cannot be answered analytically, we can simulate the growth process based on Equation 1 to find out the answer numerically (see Web Appendix B at http //www marketingpower com/jmmay09) With the average parameters obtained in our empirical analysis (we describe this subsequently), the growth parameters of the followers needed to be more than twice those of the pioneer for the follower to overcome the interaction-based advantage of the pioneer and catch up to it[1] We summarize this finding in the following proposition

> P_3 The growth parameters of the follower (p and q) must be substantially larger than the corresponding growth parameters of the pioneer for the follower to overcome the interaction-based advantage of the pioneer and catch up to it

The Western European Cellular Market

In this section, we empirically explore the dual pattern, aiming to examine the robustness of the stylized model predictions in an actual market setting in which brands are similar This analysis comprises three stages First, we explore the prevalence of the dual pattern in cellular markets in Western Europe Second, we measure the magnitude of cross- and within-brand influences to determine how they comply with the conditions stated in the formal analysis Third, we test whether there is an empirical association between cross- and within-brand influences and the growth of the gap over time, and we test the validity of alternative explanations

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[1] We conducted a (Mathematica-based) extended simulation using a full factorial experiment on the model parameters For each parameter combination, we measured the amount by which p and q of the follower should be multiplied to overtake the pioneer The algorithm determined the minimum multiplier needed for the newcomer to overtake the pioneer at a given time point (heuristically set at 30) This is a conservative choice because if we wanted the follower to become the leader earlier, multipliers should have been higher The result of these simulations is that the growth parameters of the follower needed to be more than 2 14 the size of the pioneer for the follower to overcome the interaction-based advantage of the pioneer and catch up to it (for details, see Web Appendix B at http //www marketingpower com/jmmay09)

The Data

Obtaining detailed brand-level growth data for our case is not trivial First, most empirical analysis of new product diffusion has been conducted at the category level, for which data are readily available Second, data quality problems arise in the early growth of the product life cycle (Golder and Tellis 1993) For example, because we used survey data in retrospect, successful late entrants that were not actually the first entrants were considered pioneers, while failed pioneering efforts were not considered (Hauser, Tellis, and Griffin 2006) Finally, we investigated a market in which brands are similar to control for other factors that may create noise in the data

We obtained a high-quality brand-level growth database for the European cellular service industry Cellular markets are both relatively new and highly documented Thus, they have been used for market growth analysis that focuses on topics such as the diffusion of successive generations of products (Danaher, Hardie, and Putsis 2001), optimal pricing (Danaher 2002), and multinational category-level diffusion (Dekimpe, Parker, and Sarvary 1998) Because of the attention this significant market has drawn from its birth, some private market research firms have collected data not only on growth but also on key performance indicators, such as churn, price, and quality

Our study focuses on the Western European cellular service markets, which were the first to be launched commercially, thus, these markets provide adequate data for examining pre- and postcompetition growth These markets were monitored from their initial stages, and data quality and richness are superior to those of most other industries Unlike markets such as Japan or the United States, in which the cellular market is fragmented and composed of several service providers, in Western Europe, each of a small number of competitors enjoys full coverage in its respective country, making the competition structure straightforward

Importantly, this industry has been regulated, leading to two favorable consequences for our purposes First, the cellular industry began its growth in a monopoly market structure Only at a later stage were one or more competitors allowed to enter the market Thus, we can identify exactly when the first entrant began and when others joined In addition, market entry of the follower can be treated as an exogenous factor, as in our model In addition, because of regulation, many operational aspects of the firms were monitored and controlled to support long-term competition, among them some aspects of pricing, switching costs, availability of infrastructures, and other barriers to entry (European Commission Council 1999) For example, bundling the cellular service with a regular telephone line offered by a current market player was not allowed

Thus, regulation considerably reduced the noise associated with the reaction of the first entrant to the entry of the follower and created a situation of rather similar brands operating in the same market In a sense, these cellular markets can be viewed as a large-scale, natural "market laboratory" that enables us to study the effect of within-brand and cross-brand communications on growth The data set contains annual subscriber data for each provider in the 16 major competitive markets in Western Europe, from their launch until the end of 2005 Measurements are made on December 1 of each year We excluded minor markets, such as Andorra, Monaco, Luxembourg, and Greece, where the competitive structure was breached early on as a result of mergers of operators The data are provided by the World Cellular Information Service database, which is widely used in the cellular industry and contains subscriber data and some operational data We also searched the relevant business press to track special events and regulatory actions

All the markets in our data set began as monopolies, usually of state-owned telecommunication companies that had provided landline services Most were opened to competition during the 1990s, with an average monopoly time of 7 8 years The number of service providers ranged between two and five per country On average, the first two entrants in the country occupy 78 7% of the market share Thus, to be consistent with the focus of the model we presented and to keep the analysis simple, we focused on the first two entrants in each country

One exception is the United Kingdom, where the third entrant (Orange) later became equivalent in size to the first two and even a market leader Orange's extraordinary brand-building efforts in England are well documented and, in a sense, may not be consistent with the "similar brand" approach of the basic model in Equation 2 To be consistent with the other countries, we still analyze the first two firms in the United Kingdom but note that this case may not fit our approach well In three countries—Ireland, Sweden, and the United Kingdom—the original first entrants did not take off, mainly because of a lack of investments by the service provider (in the United Kingdom, for example, British Telecom was awarded the license, but it eventually decided not to invest resources in mobile telephony) Thus, for these countries, we viewed the first entrant as the first service provider that took off Table 1 provides a list of the cases we used

The Ubiquity of the Dual Pattern

We begin with a simple descriptive analysis of the dual pattern phenomenon Figure 1 illustrates the number of subscribers over time for the 16 countries of the data set we analyzed In 15 of the 16 countries, the first entrant remained the market leader

Considering first the early growth of the later entrant (P_2), we compared the takeoff time of both the first entrant and the later entrant To identify takeoff, we used Tellis, Stremersch, and Yin's (2003) threshold approach Table 1 presents the takeoff points for the firms in our data set, from which the following result could be ascertained

> Result 1 The takeoff time of the late entrant is significantly shorter than that of the first entrant While average

TABLE 1
Cellular Service Providers and Their Takeoff Time

	First Entrant			Second Entrant		
Country	Operator	Year of Entry	Takeoff Time (Years)	Operator	Year of Entry	Takeoff Time (Years)
Austria	Mobilkom	1985	6	T-Mobile	1996	2
Belgium	Belgacom	1987	8	Mobistar	1996	2
Denmark	TDC Mobile	1982	12	Sonofon	1992	2
Finland	TeliaSonera	1982	7	Elisa (Radiolinja)	1992	3
France	France Telecom	1985	9	SFR	1989	7
Germany	T-Mobile	1985	7	Vodafone D2	1992	5
Iceland	Iceland Telecom	1985	9	OG Vodafone	1998	2
Ireland	Vodafone	1993	3	O2	1997	2
Italy	TIM	1985	6	Vodafone Omnitel	1995	2
The Netherlands	KPN Mobile	1985	10	Vodafone	1995	2
Norway	Telenor	1982	9	Netcom	1993	2
Portugal	TMV	1989	8	Vodafone	1992	4
Spain	Telefonica Moviles	1982	13	Vodafone	1995	2
Sweden	TeliaSonera	1982	7	Tele2, Vodafone	1992	2
Switzerland	Swisscom	1987	8	TDC	1998	2
United Kingdom	Vodafone	1985	8	T-Mobile	1993	6
Average takeoff time			8.1			2.9

takeoff time for the first entrants was 8.1 years, average takeoff time for the second entrants was only 2.9 years.

Other factors can also affect a second entrant's rapid takeoff, such as the overall tendency of takeoff to shorten over the years (Tellis, Stremersch, and Yin 2003). A way to still consider this phenomenon in the context of our model is to examine the existing penetration of the pioneering brand. Our formal analysis (see P_2) shows that if market penetration at the time of the follower's entry is not too high, the model predicts that the more customers the first entrant has, the easier it is for the follower to take off using cross-brand communications. Thus, we can expect that the earlier takeoff of the follower is associated with higher market penetration of the first entrant at the point of follower entry. In our data set, the average penetration rate of the first entrant at the time of competition entry is 7%, thus, we expect the correlation to hold. Indeed, the Pearson correlation between takeoff time and the first entrant's penetration rate at competition entry is $r = -.46$ ($p = .07$).

Result 2. A higher market penetration of the first entrant at the point of entry of the follower is associated with an earlier takeoff of the follower.

Another aspect of the dual pattern is the growing gap in the number of users. Recall that according to the model, if the within-brand influence is stronger than the cross-brand influence, the gap is expected to increase over time, however, if both communication types are equal, their curves are parallel. A decrease in the gap is expected in rarer cases of negative within-brand information. We expect that in most cases, the gap will increase or at least remain constant over time. The gap-widening rate reflects the change in the difference in the number of subscribers between the first and the second entrant for each period t since the competitive entry. To enable comparison between countries, this difference is normalized by the market potential, that is, for a country y, the gap at time t is defined as $gap_{yt} = [N_{iy}(t) - N_{jy}(t)]/m_j$. Then, for each country y, we performed a regression of this difference over time $gap_{yt} = \alpha_{0y} + \alpha_{1y}t + \varepsilon_y$. The slope α_{1y} of the change can serve as an indicator of the widening of the gap and thus is our measure for the gap-widening rate. Table 2 presents the results of this measurement for all the countries in our data set. In 12 of the 16 countries, the slope is positive, that is, the gap increases over time. In four countries, it is not significantly different from zero ($p > .05$). In none of the countries does the gap decrease significantly over time. These results comply with the data in Figure 1 for all the countries except Germany.[2]

Result 3. The gap in the number of subscribers between the first entrant and the follower either increases on average over time (12 of 16 countries) or remains constant on average (4 of 16 countries). We did not observe an average decrease of the gap in any of the countries.

The Magnitude of Within- and Cross-Brand Effects

Our next step is to obtain measurements of the within- and cross-brand influences. We used Equation 1 for the first and second entrant in each country, and as in the formal analysis, we assumed that $q_i = q_j = q$ and that $q_{ij} = q_{ji}$. One change we made from the formal model in the previous section was to allow a difference in the values of external influence parameter p, thus reflecting the capacity of brands to

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[2] In Germany, Vodafone was closing the gap to the first entrant (T-Mobile), and the gap was opened only in 2000, therefore, there is a period of a decreased gap and a period of an increased gap that our single linear measure cannot capture.

FIGURE 1
The Dual Pattern of Follower's Initial Fast Growth and First Entrant's Increasing Later Gap

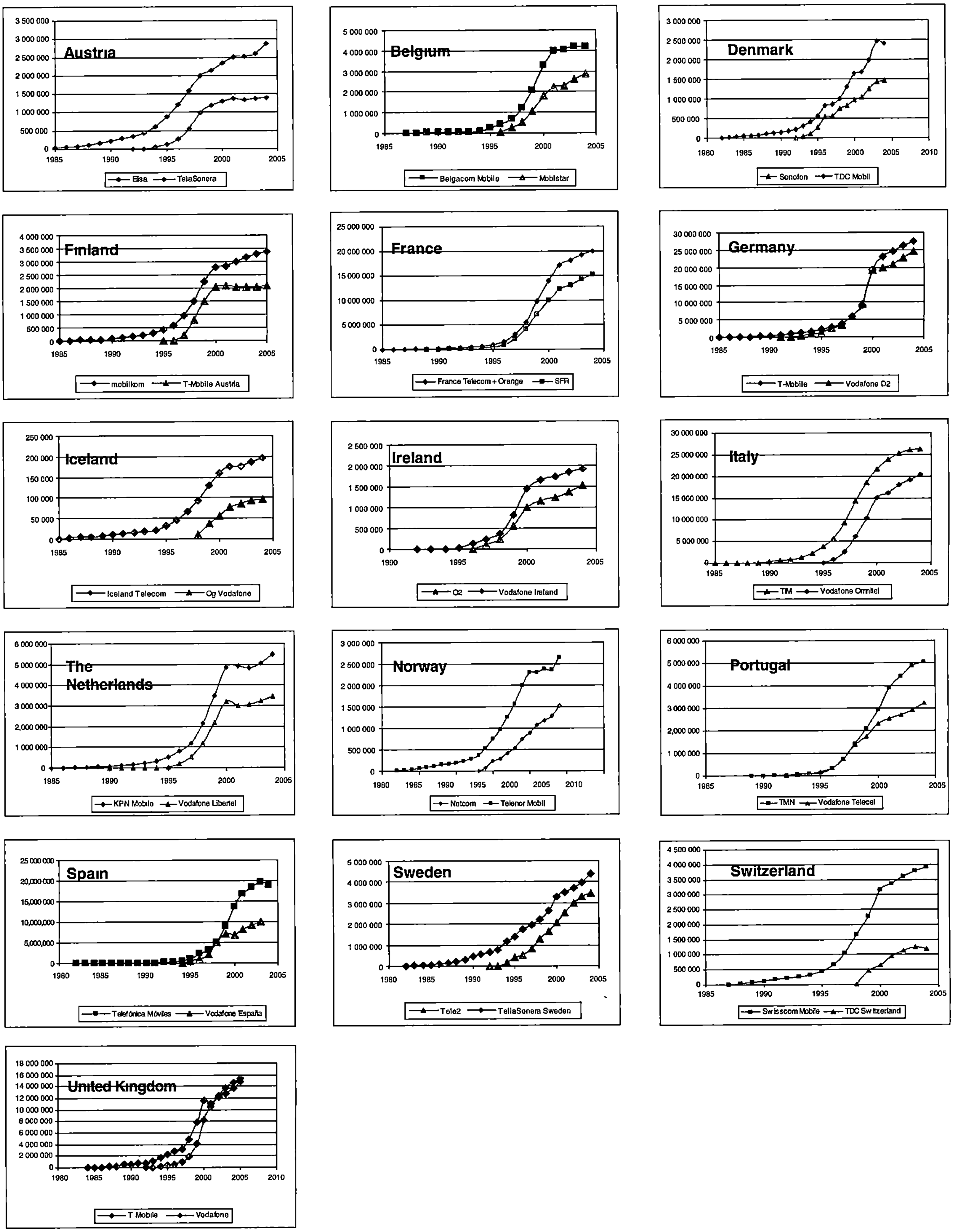

TABLE 2
The Gap-Widening Rate Estimation (Average Change Rate of Gap in Number of Subscribers over Time)

Country	Slope (Widening Rate)	*p*-Value	Trend
Austria	0140	0005	Increase
Belgium	0197	0082	Increase
Denmark	0157	0000	Increase
Finland	0133	0043	Increase
France	0104	0000	Increase
Germany	0050	0055	Increase
Iceland	0074	0758	Constant
Ireland	0114	0219	Increase
Italy	0032	2450	Constant
The Netherlands	0282	0001	Increase
Norway	0196	0001	Increase
Portugal	0212	0000	Increase
Spain	0344	0003	Increase
Sweden	– 0001	9469	Constant
Switzerland	0322	0014	Increase
United Kingdom	– 0081	0430	Constant

affect consumers through their promotional activities For each country, we estimated the penetration curves simultaneously, using seemingly unrelated regression (PROC MODEL in SAS) Table 3 presents the parameter values

Table 3 shows that for all the countries except Germany, cross-brand influence is weaker than within-brand influence $(q_{ij} < q)$ The average ratio of q_{ij} to q is 55, that is, it could logically be expected that there is significance to the brand ownership of the adopter who is engaged in the communication (i e , a communication with an adopter of a brand leads to greater chances of the consumer acquiring that brand) This result illustrates the importance of explicit representation of within-brand and cross-brand influences Considering the two influences equal leads to overestimation of the cross-brand influence and underestimation of the within-brand influence, a bias that might harm the fit and forecasting

Other Forces at Play

Our basic analysis of the dual pattern assumed similar brands, but in real life, multiple factors can challenge this assumption, affect first entrants' advantage, and possibly provide alternative explanations to the dual pattern we witnessed Thus, we consider some of the major alternative factors that might serve as explanations for the dual pattern in the markets we analyzed, and we compare them with the communications explanation

Price difference (PriceDiff) Prices can have significant influence on market evolution A first entrant's ability to reduce its prices sharply enables it to draw more customers and open up a gap Our data set contains quarterly price data (for most quarters) for a minute of peak airtime, in U S dollar nominal values, since 1993 (no price data are available for most of the current decade, in which the database managers stopped assessing average price because of the growing complexity of the plans) In cases in which competition entered after 1993, we used data from the competition's entry date The price measure we have is the average price for all programs, including roaming charges to other networks We operationalized this variable for price differences as the average of the difference in price per minute between the first and the second entrants

Although we use the value of PriceDiff in a multivariate analysis, even an initial analysis of the data indicates that price may not be a good explanation for the gap Of the 16 countries whose data we studied, the average price of the first entrant was lower than the average price of the follower in only 2 countries If anything, PriceDiff should have helped close the gap, not open it To examine this point further, we used the generalized Bass model (Bass, Krishnan, and Jain 1994) Thus, Equation 4 is a generalized Bass

TABLE 3
Parameter Estimation for the Western Europe Cellular Market

Country	p_i: First Entrant	p_j. Follower	q: Within-Brand	q_{ij}· Cross-Brand	q_{ij}/q	m	R^2: First Entrant	R^2. Follower
Austria	0	0	5924*	4423*	747	5,257,091*	922	867
Belgium	0	0083	824*	1372	167	6,859,488*	924	832
Denmark	0023	0112*	3157*	0	000	4,429,937*	437	502
Finland	0	0	4234*	1667*	394	4,174,702*	709	193
France	0013	0031	7051*	0174	025	36,563,972*	797	777
Germany	0024	0	1969	7183*	3 648	52,182,828*	69	498
Iceland	0	0027	4562*	2584*	566	293,597*	777	917
Ireland	0114	0316*	7163*	0	000	3,546,547*	557	765
Italy	0057	0	4086*	2899*	709	47,632,623*	751	844
The Netherlands	0	0	6563*	3174*	484	8,527,233*	203	757
Norway	0028	0089	2949*	0496	168	4,906,969*	257	699
Portugal	0079	0026	6405*	0	000	8,567,577*	876	41
Spain	0006	0097	8392*	0	000	28,867,446*	871	306
Sweden	0015	0	2262*	1764*	780	8,417,699*	586	853
Switzerland	0003	0045	5457*	1775*	325	5,239,988*	713	659
United Kingdom	0	0	4078*	3472*	851	29,164,818*	31	82

*p < 05

model extension of Equation 1, where f is some decreasing function of price

$$\text{(4)}\qquad \frac{dN_i(t)}{dt} = \left[p_i + \frac{q_i N_i(t)}{m} + \sum_{j \neq i} \frac{q_{ij} N_j(t)}{m}\right] \left[m - \sum_i N_i(t)\right] f(\text{price})$$

To apply the new model to the data, using exponential function, we extrapolated the years during which no price data were available, and we applied a linear effectiveness function f in Equation 4. Of the 12 countries in which the model converged, the price coefficient was not significant in 7 of them, but the coefficient had the right (negative) sign in the 5 significant ones. To test whether the remainder of the parameters changed in these countries after introducing the price data, we tested the new parameters against that obtained with Equation 1. The 5 countries in which price was significant have five parameters each (two each for p and q and one for the market potential). Of these 25 parameters, 24 have not changed (at the 5% significance level).

Network effects. Network effects can considerably influence the growth of markets for new products (Stremersch et al. 2007). A key rationale as to why network effects may affect customer choice in cellular markets is the widespread pricing schemes that offer lower rates for talking within the network (Birke and Swann 2006). Network effects are of special interest in our case because they create an increasing return mechanism based on the number of customers, which may be difficult to distinguish empirically from the communications effects on which we focus.

Although distinguishing between the two is indeed nontrivial, a few issues should be taken into account. First, network effects should indeed help bolster the market leader. Thus, in a network effects–dominated scenario, the follower would have a difficult time initially taking off. However, this is not consistent with the fast follower takeoff that we actually observe. In contrast, within- and cross-communications processes explain both the early rise of the follower and the long-term disadvantage of the first entrant that we empirically observe. Second, the extent to which the number of subscribers captures network effect in our case is questionable. For example, Birke and Swann (2006) study the cellular market in the United Kingdom and conclude that though there may be some network effect that stems from the number of subscribers, the more dominant network effect stems from the choices of other members of the family (which is less relevant to us).

A support to that effect in the European market comes from the work of Turnbull, Leek, and Ying (2000), who conducted an in-depth study of consumer decision making in the U.K. cellular market. They find that though consumers were aware of market competitors in general, they were confused about not only the difference between them but also competitors' exact roles or positions within the structure of the industry. Turnbull, Leek, and Ying also find that among possible information sources, word of mouth played the most important role in cellular choice. Finally, the finding that across our database average price was mostly lower for the followers' customers is important because it takes into account actual minutes talked both within and outside the network. Possibly, the follower cellular operators internalized their disadvantage due to the smaller network and lowered their prices accordingly. Consequently, price-related network effects may not have played a dominant role in the growth of these markets.

Churn difference (ChurnDiff). Churn, or customer defection, has historically had a considerable effect on competitive position in cellular markets. Churn rates are affected by customer satisfaction, switching costs, and the brand equity of the competitors. Theoretically, if the churn rates for the first entrant are much lower than that of the competitor, this may explain the gap. However, note that because the follower has considerably fewer customers after entry, the difference between the churn rates of the two must be large to explain a large gap in customers. Our data set contains quarterly data of monthly churn for most quarters since 1997 for all the countries studied except Belgium, Iceland, and Ireland. We operationalize this variable for churn differences as follows: For each country, the average churn level of each competitor is computed, and then the averages of the first and second entrant are subtracted. We use a single measure because the data are not complete and do not enable a quarter-by-quarter pair comparison.

In general, we found that the differences in churn rates were not large; indeed, they were surprisingly small (on average, across all countries, average monthly churn rate was 2.272% for the follower versus 2.261% for the first entrant). Yet, on average, in most countries, churn rates tended to be lower for the first entrants. In addition, we noticed that churn rates did not change much over the years. Exceptional cases are those in which number portability was introduced (as in Finland), which can cause a sudden increase in churn.

To examine the effect of churn further, we corrected the number of new customers in each period, taking into account churn, in line with Gupta, Lehmann, and Stuart's (2004) approach. We assume that at time t, the observed net differences in the number of customers of the pioneer (i) and the follower (j) are dN_i^{ob}/dt and dN_j^{ob}/dt, respectively. We denote with dN_i^m/dt and dN_j^m/dt the number of customers who joined from the market potential (i.e., the number of adopters). The churn rates are a_i and a_j. Thus,

$$\text{(5a)}\qquad dN_i^{ob}/dt = dN_i^m/dt - a_i N_i + a_j N_j, \text{ and}$$

$$\text{(5b)}\qquad dN_j^{ob}/dt = dN_j^m/dt - a_j N_j + a_i N_i.$$

Because we observed the number of adopters and know the churn rate, we can retrieve the actual number of adopters. To apply the new model to the data, we extrapolated for the years in which no churn data were available. Note that given the rather similar churn rates in our data, because the pioneer had more customers initially, its loss from churn was greater than that of the follower. Thus, following the approach we present here, to obtain the observed widening gap, the interaction-based advantage should by

TABLE 4
The Gap-Widening Rate Estimation for Observed and Churn-Compensated Data

Country	Gap-Widening Rate on Observed Data	Gap-Widening Rate on Compensated Data
Austria	0140	0533
Belgium	0197	0927
Denmark	0157	0644
Finland	0133	2151
France	0104	0251
Germany	0050	0122
Iceland	0074	1576
Ireland	0114	0609
Italy	0032	0223
The Netherlands	0282	0518
Norway	0196	0324
Portugal	0212	0460
Spain	0344	0802
Sweden	– 0001	1334
Switzerland	0322	0972
United Kingdom	– 0081	0296

even greater because the pioneer must overcome the churn This is indeed what we find from an empirical analysis, compensating for churn (see Table 4)

Technology (%GSM) Pioneering advantage or disadvantage can be a function of the technologies the various market players use In our case, however, the advantage is with the follower The "technology vintage effect" indicates pioneering disadvantage in which the later entrant uses improved technology that enables higher quality and lower costs (Bohlmann, Golder, and Mitra 2002) Indeed, in the countries we analyzed, the first entrant entered with analog technologies and only later moved gradually over to digital technologies Conversely, the second entrants entered offering all digital technology (GSM), which was considered superior, and the entire European market eventually moved over to this

To quantify and observe possible technological differences among the competitors, we used a measure (%GSM) for the technological differences the percentage of first entrant GSM users at competition entry The assumption is that the higher this percentage, the smaller is the difference among the competitors

Control of infrastructures (Penetration) Another source of pioneering advantage may be the control of resources the first entrant gains during its time as a monopoly In the cellular industry, such resources can be locations of transmission antennas, established relationships with suppliers, and employees We argued previously that the penetration level of the first entrant at the follower's entry helps the follower initially reach takeoff However, this penetration level can also serve as a proxy to the control of infrastructures and, thus, as an aid to first entrant advantage Thus, the Penetration variable to be used is the penetration level (relative to the market potential) of the first entrant at competition entry We note that despite the long time until the market became open to competition (7 8 years on average), the first entrants did not manage to capture a large portion of the market The average penetration rate at competition entry is estimated to have been just 7%

Number portability (N-portability) A barrier of switching between providers of mobile services is the inability of consumers to continue the service with their current phone number The 2002 Universal Service Directive of the European Union required mobile operators to implement number portability, thus reducing the switching costs to consumers Some European countries implemented this change before the 2002 directive, and others did so much later Thus, the earliest country in our list to implement number portability is England in January 1999, and the most recent is Austria in October 2004 (Electronic Communications Committee 2003, Smura 2004) We operationalize this variable by measuring the time each country took (in months) from the introduction of cellular service to the implementation of number portability

Next, we examine the extent to which a communications pattern helps explain the gap in customers, compared with other factors we could quantify The dependent variable is the gap between the first entrant and the follower, for which we use the gap-widening rate calculated in Table 2 For the independent communications parameter, we used the ratio of q_{ij} to q, or the ratio between the cross-brand and the within-brand influences As Result 2 indicates, the stronger the within-brand effect than the cross-brand effect, the more the widening gap favors the first entrant Thus, we expect that this variable's coefficients will be negative, that is, the weaker the cross-brand influence than the within-brand influence, the higher is the widening rate of the gap Additional independent variables are price difference, churn difference, penetration level of the first entrant at the follower's entry, the percentage of GSM users by the first entrant at that time, and number portability The regression used data from 12 countries, excluding the countries for which we did not have churn data, and Germany The results appear in Table 5

TABLE 5
Other Influences on the Widening Gap: A Two-Stage Process

Parameter	Estimate	*p*-Value
Intercept	02226*	0297
q_{ij}/q	– 02993*	0620
ChurnDiff	07593	7572
PriceDiff	01060	8601
Penetration	– 01134	8687
%GSM	02708	1161
N-portability	– 00003	8421

$^*p <$ 1, $R^2 = 79\%$

Notes The variable q_{ij}/q represents the ratio of cross-brand to within-brand influences, and ChurnDiff and PriceDiff are the average difference in churn and price between the pioneer and the follower Penetration and %GSM are the percent penetration and percent digital (GSM) of the pioneer at entry time of follower, and N-portability measures the time at which consumers could change providers while keeping their own mobile phone number

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Table 5 shows that the only significant variable is q_{ij}/q. As we expected, the coefficient is negative, that is, the weaker the cross-brand effect than the within-brand effect, the less the late entrant benefits from cross-brand influence, and therefore the advantage of the first entrant over time increases at a higher rate. To validate this result further, we conducted an additional test. In the preceding analyses, we used as a dependent variable the measurements of the gap-widening rate presented in Table 2. Thus, we performed a two-stage process. (1) We computed the gap-widening rate, and (2) we tested its dependence on the variables. These two steps can be unified into a single regression that simultaneously measures the gap-widening rate and explains the widening. If the d_y are dummy variables for the country and x_k is the kth explanatory variable (q_{ij}/q, ChurnDiff, PriceDiff, Penetration, %GSM, and N-portability), the combined model is as follows:

(6) $$\text{gap}_t = \alpha_{01}d_1 + \alpha_{02}d_2 + \dots + \alpha_{0Y}d_Y + (\beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_kx_k)\,t + \varepsilon$$

Excluding again the outlier of Germany, the regression results imply that, as in the previous analysis, the ratio of q_{ij} to q is significant. An additional source of influence that was significant in this analysis is the %GSM—that is, the percentage of GSM users of the first entrant at the time of competition entry. The variable %GSM is an indication of technological difference, or the level of technological substitution. Its sign is positive, that is, the higher the number of first entrant subscribers who already switched to GSM at competition entry, the lower is the technological advantage of the follower, a situation that favors the first entrant.

Other Models at Play

The Western European data enable us to compare the approach presented here with previously available models of brand growth. We compare three models, which represent three approaches to brand-level diffusion and the communication effect. The first is the model by Krishnan, Bass, and Kumar (2000) (KBK), in which cross-brand and within-brand influences are equal. That is, the information is only at the category level, and there is no importance to the brand ownership of the adopter who is the source of the communication. The second model is by Kalish, Mahajan, and Muller (1995) (KMM), in which the communications influence is only within brand. The third model is the one we present here, which allows for both within-brand and cross-brand influence.

(7) KBK $$\frac{dN_i}{dt} = \left[p_i + \frac{q_i(N_i + N_j)}{m}\right] \times (m - N_i - N_j),$$

(8) KMM $$\frac{dN_i}{dt} = \left(p_i + \frac{q_iN_i}{m}\right) \times (m - N_i - N_j), \text{ and}$$

(9) Current model (CM) $$\frac{dN_i}{dt} = \left(p_i + \frac{q_iN_i}{m} + \frac{q_{ij}N_j}{m}\right) \times (m - N_i - N_j).$$

We first conducted a straightforward fit comparison of the three models. To compare the models meaningfully, we set the same number of parameters in each model by assuming in the CM that $q_i = q_j$ and $q_{ij} = q_{ji}$. We found that the fits are rather similar. The average R-squares for KBK, KMM, and CM were 64.6%, 63.4%, and 64.0%, respectively. Furthermore, the three models did not differ in their forecasting abilities using two-step-ahead predictions.

The advantage of the CM is captured in the less restricted description of the mechanism that drives brand-level growth. Specifically, to fit as well, the other two models must make assumptions that may not be robust and are unnecessary under our more general approach. Note that in its full version, the CM is a generalization of KMM and KBK, that is, KMM is the special case in which $q_{ij} = 0$, and KBK is the case in which $q_i = q_{ij}$. The CM provides the required flexibility for describing both within-brand and cross-brand influences and, thus, the dual pattern. For example, consider the growth curves in the case of identical brands ($q_i = q_j$, $q_{ij} = q_{ji}$, and $p_i = p_j$). The KBK model generates parallel curves, with a sustainable advantage to the first entrant and a shorter takeoff for the follower. The KMM generates an increasing pioneering gap, with a long takeoff time for the follower. The dual pattern observed in our data of both short takeoff and an increasing gap is unique to the CM. The other models must assume difference in the diffusion parameters to obtain this pattern.

When the brands are not identical, any growth pattern can be generated, specifically, both KMM and KBK can generate the dual pattern. However, to achieve a dual pattern, specific combinations of p and q are required. Simulations that we conducted indicate that in KBK, q of the follower must be lower than q of the pioneer to generate the dual pattern. This is because the follower enjoys full cross-brand influence, and thus lower within-brand word of mouth suffices for its growth. For KMM, because the follower does not receive any cross-brand word of mouth, its growth is slow, thus, the follower needs to have higher q and p to reach typical growth patterns. There is no apparent theoretical or market-related reason to assume that q of the follower must be lower (or higher) than q of the pioneer, thus, it might be suspected that these values result from the constraints of full (KBK) or zero (KMM) cross-brand influence constraints, which are relaxed by the more general CM.

The Case of Multiple Players

Although the model presented in Equation 1 is suitable for multiple players, the empirical analysis focused on the case of two brands: a pioneer and a follower. To what extent would additional entrants change the dynamics presented here? Intuitively, the dual pattern dynamics should apply to more players as well. Later players enjoy the larger number of previous customers for a cross-brand effect that will drive takeoff. However, the interaction-based advantage of the previous players will make growth difficult, unless the third entrant is dissimilar, introducing a superior product that will draw adopters to it. Although obtaining a closed-form analytical solution for the case of more than two players has proved to be nontrivial, simulations we conducted for the case of similar brands indicate that this is indeed the case In general, our data are also consistent with a disadvantage for further entrants In the cellular markets we analyzed, the first two entrants captured approximately 80% of the market, and in only 1 of the 16 cases did the third entrant overtake one of the first two These cases support the dynamics we expected for multiple players with similar brands We also ran the empirical analysis with three players, and the resultant regression yielded similar results to the two-player case in terms of both their R-squares and their implications In all the cases, except for that of the United Kingdom, there is a clear advantage of the first generation over the subsequent generations, and in all the cases, the takeoff of the third entrant is sharper than that of the second (this empirical analysis is available on request)

Discussion

We can summarize the results of this study as follows

- The growth of a competitive new brand is influenced by the combination of effects from the brand's own customers (within-brand) and the competitor's customers (cross-brand)
- Because of the cross-brand effect, in a market that exhibits differential entry by similar brands, the follower often enjoys a shorter takeoff time than the pioneer
- However, the pioneer may enjoy an interaction-based advantage due to a within-brands effect (i e , an increasing return mechanism by which it can acquire more new customers as a result of the larger number of initial customers) In contrast to previously identified sources of pioneering advantage, this does not demand a differing perception among brands
- The interaction-based advantage is just one factor that will eventually create the differential sales pattern However, to overcome the interaction-based advantage, consumer perception of the follower must be considerably better than that of the pioneer
- We label the combination of a fast takeoff for the follower and an overall growing gap in favor of the pioneer as the dual pattern In the Western European cellular market, the dual pattern prevails in 14 of the 16 countries The communication approach provided a better explanation than other straightforward alternative explanations

Our approach follows the increasing interest of academic marketing researchers in brand-level diffusion (Krishnan, Bass, and Kumar 2000, Parker and Gatignon 1994, Peterson and Mahajan 1978, Shankar, Carpenter, and Krishnamurthi 1998), but it differentiates between the various types of customer communication Our results indicate that the distinction between the types of communication is important, and they encourage future modelers of the brand level to study the consequences of this distinction further

Interaction-Based Advantage and Pioneering Advantage

A rich literature in marketing and related fields examines sources of pioneering advantage and disadvantage and their consequences (e g , Golder and Tellis 1993, Kalyanaram, Robinson, and Urban 1995, Srinivasan, Lilien, and Rangaswamy 2004) These sources include supply-side, or producer-based, sources and demand-side, or customer-based, sources (Golder and Tellis 1993) Highlighting interaction-based advantage complements previous findings in this regard This source is fundamentally different from other consumer-based sources because it exists with no perceived difference between the brands, while basically all identified consumer-based sources stem from a differing perception of the brand between earlier and later entrants We also show how pioneering advantage can depend on the intensity of the consumers' communications behavior, that is, the more intense the brand-level communications, the greater is the advantage, though the advantage declines with increasing category-level (and, thus, cross-brand) communications

Finally, interaction-based advantage is an increasing return phenomenon, in contrast to most perception-based advantages, which may fade as the later entrant becomes established in the market This complements previous research on increasing returns in the product growth process that has often focused on markets with specific phenomena, such as network effects or declining costs (Eisenmann 2006) The interaction-based advantage may be more widely spread because it is not restricted to specific product markets It is also consistent with the work of Arthur (1994), who notes that increasing return processes may dominate much of the economy and can be a by-product of human interactions in general

Brand-Level Takeoff

As P_2 suggests, in many cases of similar brands, the takeoff of the follower is faster than that of the earlier entrants This insight provides a contribution to the growing literature on new product takeoff Until now, takeoff patterns have concentrated on the category level and have been explained by a host of factors, including price decline, social system, and culture characteristics, product category-specific factors, country-specific economic factors, and the intercountry effect (Golder and Tellis 1997, 2004, Stremersch and Tellis 2004, Tellis, Stremersch, and Yin 2003) However, managers are probably also interested in the brand level, not just the category level

If we examine the brand level, it is reasonable to believe that the takeoff of the pioneer will be affected by the same factors that affect the category at large and have been identified in previous research Indeed, if the first entrant is a monopoly for long enough, its takeoff will be the category takeoff For the later entrants, this takeoff should be a function not only of the category-level factors (and for nonsimilar brands, differential perception) but also of the pattern of communication with the consumers of the existing brands In what may seem counterintuitive to some managers, a larger number of pioneers' customers in a market may help the new entrant's takeoff, not the opposite

The cross-brand effect has an additional implication Recent research has called for customer profitability research to account for the value of the internal dynamics among customers (Gupta et al 2006) Through a cross-brand effect, competitors' customers can have a considerable influence on the brand This effect can be negative, as in the case of brand crisis (Dahlen and Lange 2006), or positive, as in the case of new category growth Thus, competitors' customers should have positive lifetime values, even if they do not buy from the firm, and their disadoption can harm the opposing brand (Hogan, Lemon, and Libai 2003)

The Ubiquity of the Dual Pattern

Although dual pattern should be more easily recognized in markets for similar brands, the forces we identify should be at work regardless of brand similarity To what extent should a dual pattern in competitive growth markets be expected? This question is especially relevant because both empirical and conceptual work point to the possible advantage and eventual success of late entrants to markets (Hauser, Tellis, and Griffin 2006) There are two issues that determine the relevancy of the dual pattern across markets (1) the power of brand-level communication and (2) the extent of brand dissimilarity

The power of brand-level communication In some markets, brand-level communication may not be a strong force that drives adoption Consider the following examples

- *Fast-moving consumer goods* Diffusion theory is less relevant to the growth of fast-moving consumer goods, which are typically not as new or as risky as technological products Empirical findings suggest that fast-moving consumer goods markets may indeed differ in terms of pioneering advantage from durable and industrial goods (Kalyanaram, Robinson, and Urban 1995)
- *Early stages of highly innovative markets* We may not expect the interaction-based advantage in the early stages of markets for really new products If the market is novel enough, the brand may not be the focus of communication so much as the product category Thus, cross-brand communications, followed by brand-level marketing mix, will dominate

The extent of brand dissimilarity If the perceived difference among the brands is large enough, it will dominate the brand-level communication patterns we discussed here In some cases, it will supply an additional advantage for the pioneer (though not necessarily an increasing returns one) Alternatively, it will help the later entrant Although we have shown that a sizable difference between the brands is needed to overcome the interaction-based advantage, this can happen, especially in markets in which technological change is rapid, making it possible for later entrants to enjoy quality and innovation that first entrants did not (Bohlmann, Golder, and Mitra 2002, Shankar, Carpenter, and Krishnamurthi 1999)

We stress that even when brands are somehow dissimilar, cross-brand and within-brand integration continues to affect the market The question is still which effects are stronger Thus, the degree to which the dual pattern may affect markets should be examined per case and per product type Consider the case of pharmaceuticals Two similar drugs in the same category might be affected by within- and cross-brand influences, especially because social contagion affects physician decision making considerably (Bhatia, Manchanda, and Nair 2006) However, in some drug markets, later drug entrants may be more innovative (Shankar, Carpenter, and Krishnamurthi 1998), which should reduce the interaction-based advantage The entry of generics might be considered a good example for our case because the new brand is similar in terms of ingredients Yet decisions on adoption of a generic drug may be made less by physicians and more by health maintenance organizations, which often try to push the lower-cost, generic drug to physicians In this case, brand-level communication by physicians may not be the driver of growth

Markets for Competing Standards

Markets in which brands compete for a standard provide variation on the framework we presented because competing brands may often be similar in most attributes, with differences stemming from network externalities, which are a social mechanism as well The literature has argued that competing standards may slow the growth rate at the category level (Van den Bulte and Stremersch 2004), and the issue is the nature of this effect at the brand level Although our model would not capture the phenomenon of potential adopters who wait to adopt until they can determine "who the winner is," when they adopt, we expect network externalities to complement the within-brand effect and amplify the increasing return phenomenon Conversely, they will work against the takeoff of the follower There is no "cross-brand" equivalent in the case of network effects, and the lower utility due to fewer users of the standard will likely affect the follower's adoption parameters, and thus we may not observe a dual pattern

Managerial Implications

The distinction between within-brand and cross-brand effects on growth has significant managerial implications It is necessary to draw the distinction between the two when conducting market research Recently, managers have become increasingly aware of the need to research and even to affect interpersonal communications, such as word of mouth, as well as the notion that new tools to identify and build on these social affects are increasingly introduced (WOMMA 2006) Yet the distinction between the two types of interpersonal effects is rarely made, and conventional wisdom focuses only on within-brand influence To realize fully the difference between the two types and to use this knowledge for prediction and planning, firms must explicitly try to differentiate between the two by better understanding the various sources of interpersonal communications

The dual pattern we found presents additional challenges to managers who observe their own brand and that of the competition and to other stakeholders, such as market analysts If other factors are controlled for, the shorter takeoff time of a second entrant should not be surprising Because takeoff is used by managers as an important sign of the brand's health (Golder and Tellis 1997), the shorter takeoff time of the follower may mislead, it does not necessarily point to better acceptance of the market for a "better" product but rather possibly hitches a ride on the cross-brand effect Thus, other perception-based measures are probably needed to indicate whether a second brand's shorter takeoff time is indeed an indicator of future success

To realize the possible managerial biases generated by the dual pattern, consider the case of the cellular market in Sweden in the early 1990s For ten years, beginning in

1982, the Swedish cellular market operated as a monopoly, with a single operator TeliaSonera In 1992, the market was opened up to competition, and a new service provider, Tele2, entered the market TeliaSonera was a traditional, state-owned company, a monopoly of many years Conversely, Tele2 was a new firm specifically designed to compete in the cellular market Tele2 also had a technological advantage in that it operated in GSM, and when it started, all TeliaSonera's customers were still using NMT, an old analog technology Tele2 grew quickly During its first four years of operation, it gained 400,000 subscribers In comparison, TeliaSonera had worked for nine years to achieve this number No wonder TeliaSonera's executives were under stress The business press from that period reports that TeliaSonera's management considered downsizing and layoffs It was reasonable to predict that Tele2 would eventually become the market leader

As we now know (and is apparent in Figure 1), this did not happen, and our results provide an explanation as to the reason Could TeliaSonera's managers or market analysts have predicted the developing pattern? A way to do so would have been to examine the drivers of customer acquisition for Tele2 If it followed cross-brand influence, Tele2's fast growth may not have been a good indicator for future competitive power, if growth was mostly at the within-brand level, it was possible that Tele2 differed enough to have been a threat from the beginning A better understanding of the dynamics of within- and cross-brand communication could help here, as well as for many other firms

In a general sense, this study is a first step in understanding the role and implications of within- and cross-brand influence for the marketing process Although we focused here on the aggregate level, a natural next step is to examine the individual level We also need to improve our knowledge of how social communications behavior and social network structure, such as weak and strong ties (Rindfleisch and Moorman 2002), affect this process A promising avenue is that of agent-based models, such as cellular automata and small world (Goldenberg, Libai, and Muller 2001, Shaikh, Rangaswamy, and Balakrishnan 2006), which enable a more in-depth exploration of social processes and the way they aggregate to market phenomena

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J. Andrew Petersen & V. Kumar

Are Product Returns a Necessary Evil? Antecedents and Consequences

The firm–customer exchange process consists of three key parts (1) firm-initiated marketing communications, (2) customer buying behavior, and (3) customer product return behavior To date, the literature in marketing has largely focused on how marketing communications affect customer buying behavior and, to some extent, how past buying behavior affects a firm's decisions to initiate future marketing communications However, the literature on product returns is sparse, especially in relation to analyzing individual customer product return behavior Although the magnitude of the value of product returns is known to be high ($100 billion per year), how it affects customer buying behavior is not known because of a lack of data availability and understanding of the role of product returns in the firm–customer exchange process Given that product returns are considered a hassle for a firm's supply chain management and a drain on overall profitability, it is important to study product return behavior Thus, the authors empirically demonstrate the role of product returns in the exchange process by determining the exchange process factors that help explain product return behavior and the consequences of product returns on future customer and firm behavior In addition, the authors demonstrate that product returns are inevitable but by no means evil

Keywords product returns, seemingly unrelated regression Tobit model, empirical application, latent class segmentation, power transformation

Product returns are an important and necessary part of the exchange process between companies and customers In some cases, product lines have had return rates of greater than 25% (Hess and Mayhew 1997) Indeed, product returns cost U S manufacturers and retailers approximately $100 billion annually in lost sales and reverse logistics, reducing profits by 3 8% on average per retailer or manufacturer (Blanchard 2007) For this reason, many firms tend to treat product returns as a necessary evil of the firm–customer exchange process

For example, Best Buy is well known for its list of "demon" customers at local stores These customers are identified as those who have taken advantage of the product return process Because of this, they have been blacklisted and are asked not to shop at Best Buy in the future (Boyle 2006) Best Buy is not the only firm to have made the news for cracking down on this behavior Sprint recently decided that customers who overused customer service—in this context, customer complaints are similar to product returns of service—should have their contracts terminated (Reardon 2007) Sprint based the approximately 1000 contract cancellations on each customer's overuse of customer support, which can cost Sprint $2–$3 per minute However, although Sprint and Best Buy reduced their losses on these specific customers, the impact of these actions on their future profitability is still unclear This is because future profits not only are a function of current customer spending but also are affected directly by the loss in spending from customers who defect and the loss of potential new customers through negative word of mouth

Many other firms have altered their return policies to fit their product return management strategy For example, Wal-Mart allows customers to return products up to 90 days after purchase, with some exceptions, and Dell allows customers to return products within 21 days after purchase for a 15% restocking fee, also with some exceptions[1] Even with these return policies, the number and complexity of product returns is increasing with the advent of online channels (Bonifield, Cole, and Schultz 2002) To combat this problem, many companies are beginning to manage supply chains to simplify the return process for consumers (Guide et al 2006, Stock, Speh, and Shear 2002) This includes outsourcing the return process to third parties that specialize in reverse logistics, cutting costs by simplifying the return process, and even getting returned merchandise back out to the distribution channel to salvage some profits Thus, although companies are addressing the issue of handling product returns by streamlining their logistics, the scarce research on product returns in marketing has focused mainly on optimal return policies for firms (Anderson, Hansen, and Simester 2009, Wood 2001), how return poli-

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[1] For a sample of the product return policies, see Web Appendixes W1 and W2 (http //www marketingpower com/jmmay09)

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cies can affect the decision to purchase now (Nasr-Bechwati and Siegal 2005), how these policies can affect customer repurchase behavior (Bower and Maxham 2006), and evidence that product returns provide customers with an option value that is measurable (Anderson, Hansen, and Simester 2009) In addition, although Bower and Maxham (2006) consider customer repurchase behavior, their study is based only on the first product return and lacks data on marketing interactions with customers

What is clear from this prior research is that product return policies affect customer product return behavior, and in turn, customer product return behavior plays a significant role in the firm–customer exchange process Prior research has shown that a lenient product return policy potentially creates a competitive advantage for the retailer or manufacturer (Padmanabhan and Png 1997) and increases a customer's likelihood to purchase a product in the first place (Chu, Gerstner, and Hess 1998, Nasr-Bechwati and Siegal 2005) However, a lenient product return policy is not always ideal (Wood 2001), because it can lead to more product returns (Davis, Hagerty, and Gerstner 1998) and to "abuse," which can cost the firm more than it benefits (Rust, Zahorik, and Keiningham 1996) In addition, if the relationship between the current customer product return behavior and future customer value were negative, managers could give disincentives for customers to return products to maximize profits However, prior research has shown that product returns (up to a threshold) are positively related to a customer's future value to the firm (Reinartz and Kumar 2003, Venkatesan and Kumar 2004) The same result also holds true in the area of customer complaints (i e , product returns of poor service), in which it is optimal to allow for customer complaints up to a threshold (Fornell and Wernerfelt 1987) This presents a challenge to managers on how to deal with customer product returns to maximize profits

Thus, a better understanding is needed of the trade-offs that product returns can bring to the profitability of a firm Are product returns a necessary evil because they force a firm to spend too much on reverse logistics and consume losses from the sales of returned merchandise, or are product returns potentially beneficial because they can add value to the firm by reducing a customer's purchase risk or through other positive behavioral consequences (e g , higher repurchase behavior)? Thus far, research in marketing has not addressed the role of product returns in the exchange process, only that product returns affect the accurate estimation of customer demand and should not be ignored (Anderson, Hansen, and Simester 2009) In addition, there has been little research in marketing to establish metrics for managing customers strategically that include product returns Thus, by answering the following three questions, this study can help firms manage customer product returns

- What are the exchange process factors (i e , marketing, transaction, and customer characteristics) that describe customer product return behavior?
- To what extent do product returns affect customers' future buying behavior and a firm's decision to allocate marketing resources?
- Are product returns a necessary evil for firms?

In Table 1, we summarize the contribution of this study with regard to several other studies that have focused on product returns and their impact on the exchange process

A Conceptual Model of Marketing, Buying, and Product Returns

The general exchange process between a firm and a customer is made up of three distinct parts that occur continuously during the course of the customer relationship (1) firm-initiated marketing communications, (2) customer buying behavior, and (3) customer product return behavior The marketing literature has investigated how firm-initiated marketing communications affect customer buying behavior, whether through various types of advertising and sales promotion (e g , Gupta 1988) or through direct marketing communications (e g , Venkatesan and Kumar 2004) In addition, several studies have analyzed the impact of customer buying behavior on the firm's decision to conduct subsequent marketing activities (e g , Elsner, Krafft, and Huchzermeier 2004) However, customer product return behavior has often been ignored Thus, the conceptual framework for this study involves understanding the relationship among firm-initiated marketing communications, customer buying behavior, and customer product return behavior

Although understanding the relationship among these three key parts of the exchange process can be complex, there tends to be an inherent order to the process In almost all cases, firm-initiated marketing communications lead to a potential customer purchase, which in turn can potentially lead to a customer product return As a result, we represent the firm–customer exchange process as a series of three ordered actions moderated by several factors A firm's decision to send marketing communications is a function of past purchase and customer characteristics Customer buying behavior is a function of marketing communications, past purchase, and customer characteristics Customer product return behavior is a function of current customer purchases, past purchase, and customer characteristics (see Figure 1)

Theory and Hypothesis Development

In this section, we develop the hypotheses related to the antecedents and consequences of customer product return behavior, this is one of the main contributions of this study We do not introduce any hypotheses related to a firm's decision to allocate marketing resources or a customer's decision to make purchases that are not related to product returns, because these issues are not the focus of this study

Theory Development

We expect that each customer desires to maximize his or her utility when making decisions to purchase products Thus, if we analyze the process of purchasing and returning products, we can separate this process into three distinct steps First, firms send marketing communications to current and prospective customers to increase their awareness

TABLE 1
Summary of Prior Research Focused on Customer Product Return Behavior

Studies	Main Contributions Regarding Product Return Behavior
Hess, Chu, and Gerstner (1996)	•Show how to profitably control for merchandise returns by charging customers a nonrefundable fee for purchasing products (e g , shipping cost)
Hess and Mayhew (1997)	•A model to predict when product returns will occur after purchases
Padmanabhan and Png (1997)	•A study of the strategic effects of return policies on retail competition and profits for manufacturers
Davis, Hagerty, and Gerstner (1998)	•Analytically identify why there is so much variation between product return policies across retailers
Wood (2001)	•Return policy leniency increases purchase rates and product return rates for customers in remote purchase environments
Bonifield, Cole, and Schultz (2002)	•Show a correlation between perceived quality of online retailers and product return policy leniency
Nasr-Bechwati and Siegal (2005)	•The product return policy for a store is used by a customer as one of the signals for purchasing products
Guide et al (2006)	•Present a network flow with delay models that include the marginal value of time to identify the drivers of reverse supply chain design
Bower and Maxham (2006)	•A field study showing that a customer who experiences a free-based product return is more likely to purchase more in the future than a customer who experiences a fee-based product return
Anderson, Hansen, and Simester (2009)	•Provide empirical evidence that product returns give customers an option value that is measurable •Provide empirical evidence to show how varying product return policies affect firm profits
Anderson et al (2008)	•Provide an economic model of customer purchase and return behavior •Empirical evidence that customer return rates increase with price paid
Current study	•Simultaneously models customer buying behavior, customer product return behavior, and a firm's decision to allocate marketing resources •Identifies exchange process factors that describe product return behavior •Identifies the consequences of product return behavior on future buying behavior and a firm's decision to allocate marketing resources

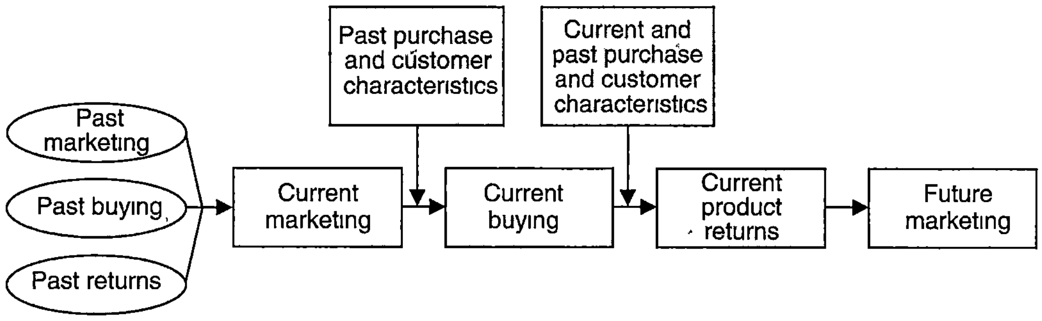
and heighten their interest in purchasing products from the firm Second, a customer chooses to purchase a product, such that the perceived prepurchase utility of that product is positive Third, after the customer has received the product, the customer evaluates the decision to purchase the product and determines whether the postpurchase utility is positive (keeps the product) or negative (returns the product) In this case, the utility of the product (both prepurchase and postpurchase utility) for a specific customer is derived from two parts (1) the cost of the product, which is known to the firm and the customer at the time of purchase, and (2) the fit of the product, which is unknown to the firm but known to the customer after the purchase The utility of a product for a specific customer can be understood as having a mean and a variance that are determined by the known (e g , price of the product) and the unknown (e g , uncertainty of product performance) factors related to the past and current purchase and customer characteristics Thus, although we do not explicitly observe the factors that affect a customer's decision to return a product, we observe exchange process factors (i e , marketing, purchase, and customer characteristics) that can help explain the mean and variance of each customer's postpurchase utilities and, in turn, each customer's expected product return behavior

Antecedents of Product Returns

Because of the inherent order of product returns in the exchange process, as illustrated in the conceptual model (see Figure 1), we focus on customer buying behavior as the key driver of customer product returns Although marketing communications may have some effect on customer product returns, it is more likely that this effect is indirect in nature This is because marketing communications tend to influence customer buying behavior directly, which then influences customer product return behavior Customers must buy products to return products, with only a few exceptions (e g., gifts) Thus, we expect that as customers purchase more products, they will return more products Although this has not been empirically tested at the customer level, the relationship between the number of purchases and the number of product returns is positive at the aggregate level (Bonifield, Cole, and Schultz 2002) This finding should not change at the customer level

If it were simply the case that each customer returned approximately the same proportion of products, (i e , if the ratio of products purchased to products returned was constant across customers), a positive relationship between purchase behavior and return behavior would be self-evident

FIGURE 1
The Interrelationship of Marketing, Buying, and Product Returns



Where

- •Past purchase characteristics = characteristics of previous purchases for customer i (e g , average interpurchase time and multichannel shopping)
- •Current purchase characteristics = characteristics of current purchases for customer i (e g , product category and channel of purchase)
- •Customer characteristics = demographic information of customer i (e g , income)

However, if different customers return different amounts of products (research has shown a great variance in return behavior across customers, see, e g , Hess and Mayhew 1997), it is important to understand the underlying relationship among customer purchase behavior, customer characteristics, and customer product return behavior To do this, we develop hypotheses regarding several common exchange process factors related to product return behavior that help explain the mean and variance of a customer's postpurchase utility

These factors include (1) gift purchases, (2) holiday purchases, (3) products purchases in new product categories (i e , cross-buying), (4) products purchased in new distribution channels (i e , multichannel shopping), (5) products purchased in new product categories and new distribution channels, and (6) products purchased on sale Next, we discuss the details of each hypothesis and present them formally Table 2 summarizes each hypothesis, noting the expected effect and the rationale for the effect

Gifts Products purchased as gifts, which are subsequently given to a third party, not only carry an economic value explicit in the price of the item purchased but also have added value from a social dimension (Sherry 1983) Consequently, even if the gift is not ideally what the recipient needs or even wants, the social dimension (or act of giving the gift) can decrease the postpurchase utility potentially less than if it were not a gift, resulting in fewer product returns This occurs because the cost of returning the gift can cause tension in the relationship between the gift giver and the recipient As a result, we propose the following

> H_1 Products received as gifts are less likely to be returned than products not received as gifts

Holiday Almost all products are seasonal In many cases, especially for retail products, the peak season is during the November–December holiday time As an example, the catalog retailer whose data we used for this study has more than 45% of all its sales during November and December, with no more than 10% of its sales in any other month of the year For other industries, the peak season may vary For example, accountants' peak service output is near March and April each year during tax season However, for the most part, any discussion about seasonal effects tends to be related to economics and statistics, and prior research has usually tried to remove these effects from the data (Radas and Shugan 1998) However, not only does behavior accelerate during the peak season, but the decision to purchase certain types of products also likely varies with the season as well As a result, many customers may purchase products in the peak season that are more likely not to fit expectations or products that the customer may find unnecessary after purchase, leading to a product return However, many "regular" purchases during the year tend to follow a more well-defined purchase pattern In addition, we expect that these regular purchases are products the customer is familiar with and frequently purchases Thus, we propose the following

> H_2 Products purchased during the holiday season (i e , November and December) are more likely to be returned than products purchased during the rest of the year

Cross-buying In this study, the act of cross-buying refers to a customer who purchases in a product category or department for the first time For example, if a customer has purchased in the men's department and then purchases in the women's department, the customer engaged in cross-buying Although cross-buying behavior has been shown to affect long-term buying behavior positively (Kumar, George, and Pancras 2008), we also expect it to affect a customer's product return behavior Customers who buy in a new category for the first time are likely unfamiliar with the

TABLE 2
The Antecedents and Consequences of Product Returns

Hypothesis	Expected Effect	Antecedents: Rationale
H_1 Past gift → current product return	–	Gifts carry not only economic value but also social value (Sherry 1983) This social value (i e , the gift giver–recipient relationship) may far outweigh the desire to return the product, even if it does not fit the needs/wants of the recipient
H_2 Past holiday → current product return	+	Customers often purchase more during the peak holiday season, for this study the retailer's peak season is November–December As a result, customers often buy significantly more than they do in the off-season and, in turn, are likely to return more products
H_3 Past new cross-buy → current product return	+	Customers who make a purchases in an unfamiliar categories (in the same channel) are purchasing products in new categories that are less likely to fit their needs and, as a result, are more likely to return products
H_4 Past new channel → current product return	–	Customers who make purchases in new distribution channels (not categories) are likely shifting familiar purchases to lower-cost or more convenient distribution channels This makes it less likely for a purchase in a new channel to be returned
H_5 Past new channel and cross-buy → current product return	+	Customers who buy new products in new channels are purchasing in unfamiliar categories and unfamiliar channels As a result, it is more likely that there will be a misfit with the product or the purchase channel, causing a product return
H_6 Past new sale items → current product return	–	Sale items cost less than regular-priced items As a result, the perceived value hypothesis suggests that customers are more likely to return items when they pay a higher price than when they pay a lower price
		Consequences: Rationale
H_7 Current product return → future buying behavior	∩	Prior research with a business-to-business firm has shown an inverted U-shaped relationship between the number of product returns and customer lifetime value (Venkatesan and Kumar 2004) Although this study is in a business-to-consumer context, we expect to find a similar relationship
H_8 Current product return → future marketing resource allocation	–	When firms make decisions to allocate resources to marketing, they try to choose the optimal allocation method to maximize future profitability As a result, we expect the firm to allocate fewer resources to customers who return products more products

product purchased (i e , added risk to the purchase process), especially in a catalog setting, in which the product cannot be tried before it is purchased We expect this to be the case even if the customer is purchasing a product in the same distribution channel If the customer has some level of uncertainty with the new product purchase in the new product category, we expect that the customer is more likely to return the product Thus, we propose the following

> H_3 Products purchased in new categories within the same distribution channel are more likely to be returned than products purchased in familiar categories within the same channel

Multichannel shopping In this study, a multichannel shopper is a customer who makes purchases across more than one distribution channel (e g , telephone, catalog, Internet) Similar to cross-buying behavior, multichannel shopping has also been shown empirically to be positively related to future customer profitability (Venkatesan, Kumar, and Ravishanker 2007) However, we expect that customers who purchase in a new channel (but in the same product category) are purchasing familiar products through different distribution channels For example, suppose a customer purchased a shirt in a retail outlet If the customer purchases another of the same shirt from the retailer, he or she may choose to buy the next shirt through the Internet, which is more convenient than going to the retail store In this case, we expect the customer to find less risk in the purchase because of the familiarity of the product being purchased, and in turn, the customer will be less likely to return the purchase from the new distribution channel We also expect that when the customer shifts same-category purchases to another channel, it is likely that he or she is purchasing the same product at a lower cost or greater convenience When a customer stays in the same distribution channel, though some of the products may be repurchases, he or she is also likely to be shopping across many different products in a given product category Thus, we propose the following

H_4 Products purchased in new distribution channels within the same product category are less likely to be returned than products purchased in familiar channels within the same product category

Cross-buying and multichannel shopping A customer who purchases a product in a new product category and a new distribution channel simultaneously is buying not only within an unfamiliar product category but also within an unfamiliar channel Because the customer is facing two different unknowns, this likely compounds the uncertainty he or she faces, thus adding significant risk to the purchase For example, if a customer is used to purchasing within the men's department in the retail store and makes a purchase from the children's department through the Internet, the unfamiliarity with both the product category and the distribution channel can cause the customer to be more likely to return the product Thus, we propose the following

H_5 Products purchased in new channels and new categories are more likely to be returned than products purchased in familiar channels and/or familiar product categories

Sale items Recent research has shown that customer return rates are not independent of the price a customer pays (Anderson et al 2008) This supports the perceived value hypothesis, which suggests that as the price of the item increases, the customer becomes more likely to return a product that lacks fit With respect to sale items, this suggests that items bought on sale are lower-priced items and are less likely to be returned by the customer Thus, we propose the following

H_6 Products purchased on sale are less likely to be returned than products purchased at regular price

Consequences of Product Returns

It is also important to understand how a customer's decision to return or not to return a product affects his or her long-term relationship with a firm We know that all purchases across the entire relationship with a firm have a certain level of uncertainty that is not known until after a purchase is made We expect that for each customer, this level of uncertainty decreases over time as he or she becomes more familiar with the products the firm offers, this will occur regardless of whether the customer returns a product In addition, a customer who returns a product satisfactorily will potentially be able to remove some additional uncertainty with future purchases by lowering the perceived risk of future purchases, knowing that products that do not fit can be returned without excess hassle Thus, understanding past product return behavior should help explain future decisions by both the firm to allocate marketing resources and the customer to make future purchases and product returns

Future buying Recent research in marketing has shown that for a business-to-business setting, there is an inverted U-shaped relationship between the number of products returned and the customer's lifetime value (Venkatesan and Kumar 2004, Venkatesan, Kumar, and Bohling 2007) Although the setting of this study is a business-to-consumer catalog retailer, not a high-tech business-to-business firm, we expect to find the same relationship Thus, we propose the following

H_7 The amount of product returns is positively related to the amount of products purchased in the future, up to a threshold (an inverted U-shaped effect)

Future marketing When firms make decisions to allocate resources to marketing, the optimal resource allocation method is set on the basis of the goal to maximize future customer profitability This occurs regardless of whether it is a decision for acquisition and retention through direct marketing initiatives (Blattberg and Deighton 1996, Blattberg, Getz, and Thomas 2001, Venkatesan and Kumar 2004), whether it is a decision pertaining to advertising and promotion expenditures (Berger and Nasr 1998, Berger and Nasr-Bechwati 2001), or when the firm is analyzing customer brand-switching behavior (Rust, Lemon, and Zeithaml 2004) In addition, firms often find that product returns (especially in the short run) are a drain on overall profitability because they are a loss of sales revenue and cost the firm resources for reverse logistics As a result, when firms make decisions to allocate resources, we expect that as a customer returns more products, he or she will receive less consideration by the firm for marketing resources Thus, we propose the following

H_8 The amount of product returns is negatively related to the amount of marketing communications a customer receives in the future

Methodology

A Model Describing the Role of Product Returns in the Exchange Process

In this section, we develop a model that helps describe the role of product returns in the exchange process between a firm and its customers To choose the appropriate model for estimating the relationships among marketing communications, buying behavior, and product return behavior, we must first account for the key modeling challenges in this problem Then, we introduce a general framework for estimating this model Finally, we conduct an empirical application of the modeling framework by using actual customer data from a catalog retail firm

Modeling Challenges

Simultaneity and endogeneity The first challenge is the inherent ordering of the three key aspects of the exchange process (Figure 1), which creates an issue of a simultaneity bias that can affect the outcome of the model estimation This occurs because each of the three dependent variables (marketing, buying, and product returns) is an explanatory variable in at least one of the other two equations As a result, it is necessary to determine jointly the parameters for each model to remove any biases from simultaneity Similarly, because of the inherent ordering of the three key aspects of the exchange process over time, there is a potential endogeneity bias that will affect the outcome of the model estimation This can occur because the dependent variables within this system of equations are dependent on explanatory factors in the current period (t), while the same explanatory factors are dependent on the endogenous dependent variables in the last period (t – 1)

To account for the potential simultaneity and endogeneity biases that are present in this modeling framework, the model we choose needs to incorporate a system of equations that allows for simultaneous estimation of the three limited dependent variables in the three different models describing marketing communications, buying behavior, and product returns In addition, each model needs to account for customer and firm behavior in the prior periods

Censored data The second challenge that needs to be addressed is that all three endogenous dependent variables in this model (product returns, buying, and marketing) have some values that are unobserved because the data are right censored The data are right censored at a given time (August 2004), and we do not observe any product returns, buying behavior, or marketing communications after this time, even though the relationship may not have ended As a result, we need to remove any bias from the parameter estimates in the model due to the censored nature of the data To do this, we augment the censored data by drawing values from a truncated normal distribution for the model estimation (Wei and Tanner 1990) We need to account for the right-censoring problem only in this case because we use cohorts of customers who made their first purchases in a given year

Truncated data The third challenge we need to address is related to the truncation of the data In this case, all three of the dependent variables in the model are left truncated at zero This occurs because resources for marketing communications are either allocated (+) or not (0), buying behavior is either observed (+) or not (0), and product return behavior is either observed (+) or not (0) As a result, the data are not distributed normally, because their range includes all numbers greater than or equal to 0 This presents some issues of estimation bias However, the solution to this problem is straightforward because it was in the data-censoring case Similar to the solution to the data-censoring problem, this truncation problem can also be solved through data augmentation (Wei and Tanner 1990) The data that are truncated at 0 can be augmented by drawing values from a truncated normal distribution to remove any bias in the estimation procedure

Skewness In addition to using the augmented endogenous variables as dependent variables in each of the three equations, we use these variables as independent variables We use squares of the augmented variables to determine whether we uncover any saturation effects in the analysis Using the squared augmented variables creates a problem of right skewness, compared with the squared values of the original endogenous variables However, we correct for this issue by using a cube root power transformation of the squared augmented variable (Chen and Deo 2004) The result of this power transformation is a variable that more closely approximates the distribution of values of the original squared endogenous variable The details on this power transformation are available in Appendix A

Heterogeneity The final challenge we need to consider is that of heterogeneity, both unobserved and observed To account for observed heterogeneity, we include several demographic variables (e g , income) in each of the three models To account for unobserved heterogeneity, we chose latent class segmentation This latent class segmentation helps us determine how many latent segments of customers exist after we account for the variance in marketing, buying, and product returns using a set of exogenous predictors, lagged endogenous predictors, customer characteristics, and demographics

The Seemingly Unrelated Regression Tobit Model

To account for the key modeling challenges described in the previous section, we propose the following seemingly unrelated regression (SUR) Tobit model

$$\text{(1)}\quad PR^*_{it} = \alpha_0 + \alpha_1 Buy^*_{i,t-1\rightarrow t} + \alpha_2 (Buy^{*2}_{i,t-1\rightarrow t})^{1/3} + \alpha_3 PR^*_{i,t-1} + \alpha_4 (PR^{*2}_{i,t-1})^{1/3} + \beta' Z_{PR} + \varepsilon_{PR},$$

$$\text{(2)}\quad Buy^*_{i,t-1\rightarrow t} = \delta_0 + \delta_1 Mktg^*_{i,t-1\rightarrow t} + \delta_2 (Mktg^{*2}_{i,t-1\rightarrow t})^{1/3} + \delta_3 Buy^*_{i,t-2\rightarrow t-1} + \delta_4 (Buy^{*2}_{i,t-2\rightarrow t-1})^{1/3} + \delta_5 PR^*_{i,t-1} + \delta_6 (PR^{*2}_{i,t-1})^{1/3} + \lambda' Z_{Buy} + \varepsilon_{Buy}, \text{ and}$$

$$\text{(3)}\quad Mktg^*_{i,t-1\rightarrow t} = \omega_0 + \omega_1 Mktg^*_{i,t-2\rightarrow t-1} + \omega_2 (Mktg^{*2}_{i,t-2\rightarrow t-1})^{1/3} + \omega_3 Buy^*_{i,t-2\rightarrow t-1} + \omega_4 (Buy^{*2}_{i,t-2\rightarrow t-1})^{1/3} + \omega_5 PR^*_{i,t-1} + \omega_6 (PR^{*2}_{i,t-1})^{1/3} + \phi' Z_{Mktg} + \varepsilon_{Mktg},$$

where

$$(\varepsilon_{PR}, \varepsilon_{Buy}, \varepsilon_{Mktg})' \sim \text{iid}N(0, \Omega),$$

PR^*_{it} = the value of the augmented endogenous variable Product Returns,
$(PR^{*2}_{it})^{1/3}$ = the transformed value of the squared augmented endogenous variable Product Returns,
$Buy^*_{i,t-1\rightarrow t}$ = the value of the augmented endogenous variable Buy,
$(Buy^{*2}_{i,t-1\rightarrow t})^{1/3}$ = the transformed value of the squared augmented endogenous variable Buy,
$Mktg^*_{i,t-1\rightarrow t}$ = the value of the augmented endogenous variable Marketing,
$(Mktg^{*2}_{i,t-1\rightarrow t})^{1/3}$ = the transformed value of the squared augmented endogenous variable Marketing, and
$Z_{PR}, Z_{Buy}, Z_{MKTG}$ = the exogenous variables, lagged-endogenous variables, and covariates used as predictors for each of the three equations

For this model, the first regression in the SUR model has product returns (PR^*_{1t}) as the augmented dependent variable In this case, product returns are a function of a customer's past purchase behavior ($Buy^*_{1,t-1 \rightarrow t}$), past product return behavior, and the characteristics of the purchase behavior (Z_{PR}) For the second equation, a customer's buying behavior is a function of the marketing spent on a given customer ($Mktg^*_{1,t-1 \rightarrow t}$), the customer's past buying and product return behavior, and other characteristics of the customer's purchase behavior (Z_{Buy}) The augmented dependent variable of the third model is the firm's allocation of marketing resources to a customer This is a function of past customer purchase behavior, product return behavior, and past marketing resources allocated to the customer We also use the transformed squared augmented variables as independent variables in each of the three equations To estimate this model, we incorporate a Monte Carlo expectation-conditional maximization (MCECM) algorithm as detailed in Appendix B

An Empirical Application

The data we used for this study come from a business-to-consumer company that sells many different categories of products through the Internet, catalogs, telephone, and retail outlets The company's return policy is considered lenient in that it is willing to give a full refund or an exchange if, for any reason, the customer may not want to keep the product at any time after purchase We include only product returns, not exchanges, in the empirical application of this study These data contain information on all the transactions that occurred between January 1998 and August 2004 For the purpose of testing and validation, we use two cohorts of customers who made their first purchase any time during either 1998 (Cohort 1) or 1999 (Cohort 2) and who made at least three purchases from the company between the time of their first purchase and August 2004 We dropped customers with fewer than three purchases because the objective of this research is to understand how buying, returning, and marketing affect the long-term customer–firm relationship and not just isolated incidents of buying and returns Next, we describe the data, we also provide descriptive statistics of each cohort in Table 3

Cohort 1 The data for Cohort 1 (whose first purchase was in 1998) include 1572 customers with a total of 25,178 products purchased—on average, slightly more than 16 products per customer These purchases generated $1 08 million in revenue, or approximately $43 per purchase Cohort 1 also includes 4113 products returned—on average, slightly more than 2 4 products returned per customer These returned products generated a loss of revenue of $196,000, or approximately $48 per product return This means that, on average, approximately 1 of every 6 products purchased was returned for either a refund or an exchange (4113/25,178), falling within the range (4%–25%) that direct marketers should expect (Fenvessy 1992) In addition, these customers received 135,949 catalogs—that is, approximately 86 catalogs per customer, or 13 catalogs per customer per year (over 6 75 years)

TABLE 3
Descriptive Statistics for Cohort 1 and Cohort 2

	Cohort 1 (1998)	Cohort 2 (1999)
Customers	1572	1586
Catalogs sent	135,949	118,867
Purchases (number)	25,178	23,368
Purchases (value)	$1 08 million	$1 0 million
Product returns (number)	4113	3394
Product returns (value)	$196,000	$169,000

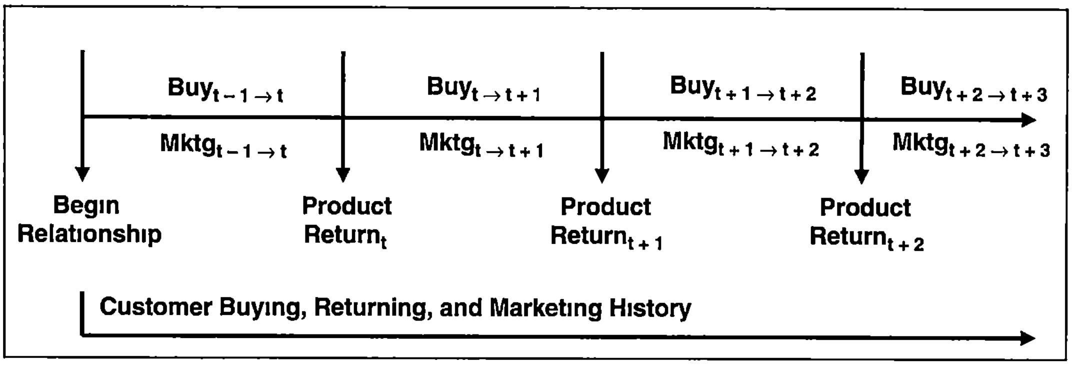
Cohort 2 The data for Cohort 2 (whose first purchase was in 1999) include 1586 customers, who purchased a total of 23,368 products—on average, approximately 15 products per customer These purchases generated $1 0 million in revenue, or approximately $43 per purchase Cohort 2 also includes 3394 products returned—on average, slightly more than 2 6 products returned per customer These returned products generated a loss of revenue of $169,000, or approximately $50 per product return This means that, on average, approximately 1 of every 7 products purchased was returned for either a refund or an exchange (3394/23,368), falling within the range (4%–25%) that direct marketers should expect (Fenvessy 1992) In addition, these customers received 118,867 catalogs—that is, approximately 75 catalogs per customer, or 13 catalogs per customer per year (over 5 75 years)

To model the data appropriately, we organized the data by the time of the product return of each customer with the company (see Figure 2) We set up the data in this way instead of using a cross-sectional time-series setup (i e , monthly or quarterly) for two reasons First, many customers (approximately 30%) have never returned a product This means that each of these customers would have no variation in the product return variable Second, we would be unable to determine the order of occurrence if a product return occurred in the same month or quarter as a purchase In one case, the purchase could have led to the product return, and in the other, the purchase could have happened immediately after the product return As a result, we chose to model the data in which the product return occasion marks the interval of time

For example, if a customer made three product returns in his or her lifetime, there would be a product return at time t, t + 1, and t + 2 (see Figure 2) Then, there would also be information about marketing communications and buying behavior before and after each product return To operationalize the marketing communication, buying behavior, and product return behavior variables for each customer (time between returns can vary greatly), we divide the variables by the number of months since the previous product return (or since the start of the relationship if it is the first product return) by each customer This gives a variable that describes the average monthly marketing communications, average monthly buying behavior, and average monthly product return behavior, which are observed and computed for each product return

In Table 4, Panels A–C, we provide a description of all the variables in the three models and their operationalizations in which the independent variables chosen for the $Buy^*_{1,t-1 \rightarrow t}$ model are based on variables used in studies

FIGURE 2
Data Setup for a Sample Customer



Notes Unit of observation is observed at each product return occasion

that analyze the determinants of customer buying behavior (Reinartz and Kumar 2003, Venkatesan and Kumar 2004) We then use the information before each product return to determine what types of firm actions and customer behaviors lead to customers returning (or not returning) products

Results

Model Fit

After dividing each of the cohorts into calibration (75% of the customers) and holdout (25% of the customers) samples, we estimated three different models for each of the two cohorts Because the fit and the parameter estimates for both cohorts were similar, we provide only the results from the Cohort 1 in the article [2] Thus, the sample for Cohort 1 (1998) includes 1179 customers with 3251 observations in the calibration sample and 393 customers with 1088 observations in the holdout sample The three models we estimate for this analysis include the following

1 Two equations of marketing and buying without product returns as an independent variable (Model 1)
2 Two equations of marketing and buying with product returns as an independent variable (Model 2)
3 Three equations of marketing, buying, and product returns (focal model of this study) (Model 3)

We first estimated these models in the SUR Tobit modeling framework using a latent class segmentation approach We describe this latent class approach and provide the results of the analysis in Appendix C From the results of the latent class analysis, we found that the optimal number of latent segments for our model was one We chose the optimal number of segments on the basis of the model with the lowest consistent Akaike information criterion (CAIC) (Jedidi, Ramaswami, and DeSarbo 1993) Thus, we provide the results of model fit and parameter estimates in the main section of this article for only the one-segment model This suggests that the predictor variables used in this study account for the heterogeneity across customers, even when the variance in the amount of product returns is high For any future studies, it is still desirable to use the latent class segmentation approach first to determine whether there are multiple latent segments of customers

In Table 5, we report the parameter estimates from the three models along with the R-square values for each equation within each SUR Tobit model For our first observation, we find that the demographic variables ($Married_i$ and $Income_i$) are nonsignificant for all three equations and in all three models In addition, the ($Buy^{*2}_{i,t-1\to t}$) variable is not as significant as a squared lagged endogenous variable in the Buy* equation across all three models

We also find that between Model 1 and Model 2, by adding product returns as an independent variable, we can significantly increase the variance explained by each equation For the $Mktg^{*}_{i,t-1\to t}$ equation, the R-square increases from 263 to 280, and for the $Buy^{*}_{i,t-1\to t}$ equation, the R-square increases from 381 to 410 When we introduce the third equation PR^{*}_{it} to the SUR Tobit model (Model 3), there is some improvement in the variance explained beyond that of Model 2 for the $Mktg^{*}_{i,t-1\to t}$ and $Buy^{*}_{i,t-1\to t}$ equations, up to 290 and 421, respectively We do not expect this increase to be large, because the models have the same predictor variables However, adding the PR^{*}_{it} equation helps improve the efficiency of the model estimation and helps account for additional covariance between equations Finally, we observe a good fit ($R^2 = 371$) in the PR^{*}_{it} equation in Model 3 This suggests that the predictors explain a significant amount of the variance for customer product return behavior

Although the results from the three models show that product returns play a key role in the exchange process, it is also important to show the consequences of not including product returns as a variable (dependent or independent) in the analysis In other words, what additional value comes from including product returns in the study? To analyze the impact of including product returns, we compare the predictive results of the three models

We compare the mean absolute deviation (MAD) in these three models' ability to predict marketing, buying, and

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[2] The results from Cohort 2 are available on request

TABLE 4
Variable Operationalization

A: The Marketing Model

Variable	Operationalization
Model: $\text{Mktg}^{*}_{i,t-1\to t}$ (Average monthly catalogs sent to customer i from time t to time t − 1)	
$\text{Buy}^{*}_{i,t-2\to t-1}$	Average monthly spending in dollars for customer i from time t − 2 to time t − 1
$(\text{Buy}^{*2}_{i,t-2\to t-1})^{1/3}$	Cube root transformed squared average monthly spending in dollars for customer i from time t − 2 to time t − 1
$\text{PR}^{*}_{i,t-1}$	Average monthly product returns in dollars for customer i at time t − 1
$(\text{PR}^{*2}_{i,t-1})^{1/3}$	Cube root transformed squared average monthly product returns in dollars for customer i at time t − 1
$\text{Mktg}^{*}_{i,t-2\to t}$	Average monthly catalogs sent to customer i from time t − 2 to time t − 1
$(\text{Mktg}^{*2}_{i,t-2\to t-1})^{1/3}$	Cube root transformed squared average monthly catalogs sent to customer i from time t − 1 to time t
Married_i	Whether (1) or not (0) customer i is married
Income_i	Income of customer i

B The Buy Model

Variable	Operationalization
Model: $\text{Buy}^{*}_{i,t-1\to t}$ (Average monthly spending in dollars for customer i from time t − 1 to time t)	
$\text{Mktg}^{*}_{i,t-1\to t}$	Average monthly catalogs sent from to customer i time t − 1 to time t
$(\text{Mktg}^{*2}_{i,t-2\to t-1})^{1/3}$	Cube root transformed squared average monthly catalogs sent to customer i from time t − 1 to time t
$\text{Buy}^{*}_{i,t-2\to t-1}$	Average monthly spending in dollars for customer i from time t −2 to time t − 1
$(\text{Buy}^{*2}_{i,t-2\to t-1})^{1/3}$	Cube root transformed squared average monthly spending in dollars for customer i from time t − 2 to time t − 1
$\text{PR}^{*}_{i,t-1}$	Average monthly product returns in dollars for customer i at time t − 1
$(\text{PR}^{*2}_{i,t-1})^{1/3}$	Cube root transformed squared average monthly product returns in dollars for customer i at time t − 1
AIT_{it}	Average interpurchase time in months for customer i since first purchase until time t
AIT^{2}_{it}	Squared average interpurchase time in months for customer i since first purchase until time t
$(\text{CB} \times \text{MC})_{i,t-1\to t}$	Interaction of cross-buy and multichannel for customer i from time t − 1 to time t
Married_i	Whether (1) or not (0) customer i is married
Income_i	Income of customer i

C. The Product Return Model

Variable	Operationalization
Model: PR^{*}_{it-1} (Average monthly product returns in dollars for customer i at time t − 1)	
$\text{Buy}^{*}_{i,t-1\to t}$	Average monthly spending in dollars for customer i from time t − 1 to time t
$(\text{Buy}^{*2}_{i,t-2\to t-1})^{1/3}$	Cube root transformed squared average monthly spending in dollars for customer i from time t − 1 to time t
$\text{PR}^{*}_{i,t-1}$	Average monthly product returns in dollars for customer i at time t − 1
$(\text{PR}^{*2}_{i,t-1})^{1/3}$	Cube root transformed squared average monthly product returns in dollars for customer i at time t − 1
$\text{Gift}_{i,t-1\to t}$	The number of gifts purchased by customer i from time t − 1 to time t
$\text{Holiday}_{i,t-1\to t}$	Number of items purchased during November–December for customer i from time t − 1 to time t
$\text{CBNew}_{i,t-1\to t}$	Percentage of the amount spent on products in new categories with no new channel purchases for customer i from time t − 1 to time t
$\text{ChanNew}_{i,t-1\to t}$	Percentage of the amount spent on products in new channels with no new category purchases for customer i from time t − 1 to time t
$\text{NewCBCH}_{i,t-1\to t}$	Percentage of the amount spent on new category and new channel purchases for customer i from time t − 1 to time t
$\text{SalesItems}_{i,t-1\to t}$	Number of items purchased on sale for customer i from time t − 1 to time t
$\text{TopCat}_{i,t-1\to t}$	The number of transactions in this retailer's most frequently purchased category for customer i from time t − 1 to time t
$\text{TopChan}_{i,t-1\to t}$	The number of transactions in this retailer's most frequently purchased channel for customer i from time t − 1 to time t
Married_i	Whether (1) or not (0) customer i is married
Income_i	Income of customer i

product returns by using the parameter estimates from the results to predict the dependent variables in the holdout sample Because there is no equation for product returns as a dependent variable in the first two models, it is evident

TABLE 5
Results from the Estimation Using Calibration Sample (75% of Households)

	Model 1	Model 2	Model 3
Dependent Variable: $Mktg^{*}_{i,t-1\rightarrow t}$			
Intercept	**.523 (.106)**	**.711 (.105)**	**.888 (.105)**
$Buy^{*}_{i,t-2\rightarrow t-1}$	**.029 (.001)**	**.028 (001)**	**.025 (.001)**
$(Buy^{*2}_{i,t-2\rightarrow t-1})^{1/3}$	**–.010 (.002)**	**–.010 (.002)**	**–.031 (.012)**
$PR^{*}_{i,t-1}$		**–.024 (.002)**	**–.026 (.002)**
$(PR^{*2}_{i,t-1})^{1/3}$		**.095 (.022)**	**046 (.023)**
$Mktg^{*}_{i,t-2\rightarrow t}$	**–.463 (.079)**	**–.376 (078)**	**–.463 (.078)**
$(Mktg^{*2}_{i,t-2\rightarrow t-1})^{1/3}$	**.416 (.130)**	**.385 (.112)**	**.389 (.135)**
$Married_i$	*098 (069)*	*063 (068)*	*030 (100)*
$Income_i$	*– 001 (001)*	*– 002 (002)*	*– 001 (001)*
Model fit R-square	263	280	290
Dependent Variable: $Buy^{*}_{i,t-1\rightarrow t}$			
Intercept	**–9.400 (3.225)**	**–11.728 (3.283)**	**–4.417 (2.118)**
$Mktg^{*}_{i,t-1\rightarrow t}$	**17.901 (.949)**	**18.132 (.962)**	**8.719 (1.053)**
$(Mktg^{*2}_{i,t-2\rightarrow t-1})^{1/3}$	**–.618 (.058)**	**–.584 (.059)**	**–.464 (.064)**
$Buy^{*}_{i,t-2\rightarrow t-1}$	**.296 (.031)**	**.291 (.032)**	**.384 (.036)**
$(Buy^{*2}_{i,t-2\rightarrow t-1})^{1/3}$	*– 040 (076)*	*– 042 (078)*	*– 062 (040)*
$PR^{*}_{i,t-1}$		**.267 (.072)**	**393 (.073)**
$(PR^{*2}_{i,t-1})^{1/3}$		**–.089 (.004)**	**–.062 (.004)**
AIT_{it}	**17.237 (1.091)**	**17.143 (1.090)**	**24.464 (1.187)**
AIT^{2}_{it}	**–.523 (.063)**	**–.520 (.063)**	**–.751 (.068)**
$(CB \times MC)_{i,t-1\rightarrow t}$	**1.146 (.275)**	**1.125 (.282)**	**1.623 (.309)**
$Married_i$	*–2 369 (2 024)*	*–1 964 (2 025)*	*1 635 (2 026)*
$Income_i$	*053 (271)*	*052 (271)*	*044 (270)*
Model fit R-square	381	410	421
Dependent Variable: PR^{*}_{it}			
Intercept			**18.040 (1.614)**
$Buy^{*}_{i,t-1\rightarrow t}$			**.374 (.012)**
$(Buy^{*2}_{i,t-2\rightarrow t-1})^{1/3}$			**–.069 (.002)**
$PR^{*}_{i,t-1}$			**.163 (.030)**
$(PR^{*2}_{i,t-1})^{1/3}$			**–.058 (.010)**
$Gift_{i,t-1\rightarrow t}$			**–1.057 (.328)**
$Holiday_{i,t-1\rightarrow t}$			**8.366 (1.074)**
$CBNew_{i,t-1\rightarrow t}$			**079 (.023)**
$ChanNew_{i,t-1\rightarrow t}$			**–.085 (.026)**
$NewCBCH_{i,t-1\rightarrow t}$			**.006 (.001)**
$SaleItems_{i,t-1\rightarrow t}$			**–1.264 (.238)**
$TopCat_{i,t-1\rightarrow t}$			**–9.683 (.921)**
$TopChan_{i,t-1\rightarrow t}$			**–8.988 (.991)**
$Married_i$			*–1 247 (921)*
$Income_i$			*– 009 (012)*
Model fit R-square	N A	N A	371

Notes Numbers in cells are means (standard deviations) Italics denote nonsignificance, and bold entries are significant at $p <$ 01 N A = not applicable

that the predictive accuracy of product returns in the third model is always better However, it is also important to determine whether there are gains in the predictive accuracy of marketing and buying behavior among the three models when product returns are entered first as independent variables and then as a dependent variable in a third equation (see Table 6)

As Table 6 shows, there is an improvement in the MAD from Model 1 (two equations without product returns), which had a MAD of 1 23 for $Mktg^{*}_{i,t-1\rightarrow t}$ and 36 64 for $Buy^{*}_{i,t-1\rightarrow t}$, to Model 2, which had a MAD of 1 19 for $Mktg^{*}_{i,t-1\rightarrow t}$ and 35 41 for $Buy^{*}_{i,t-1\rightarrow t}$ There is also an improvement in the MAD from Model 2 (two equations with product returns), which had a MAD of 1 19 for $Mktg^{*}_{i,t-1\rightarrow t}$ and 35 41 for $Buy^{*}_{i,t-1\rightarrow t}$, to Model 3, which had a MAD of 1 07 for $Mktg^{*}_{i,t-1\rightarrow t}$ (a 10% improvement) and 29 74 for $Buy^{*}_{i,t-1\rightarrow t}$ (a 16% improvement) In addition, we can predict PR^{*}_{it} in Model 3, which had a MAD of

TABLE 6
Predictive Accuracy for Models With and Without Product Returns Using Estimates from Calibration Sample (75%) to Predict Holdout Sample (25%) (MAD)

Models	$Mktg^*_{i,t-1 \rightarrow t}$ (Average Number of Catalogs/Month)	$Buy^*_{i,t-1 \rightarrow t}$ (Average Dollars Spent/Month)	PR^*_{it} (Average Dollars of Returns/Month)
$Mktg^*_{i,t-1 \rightarrow t}$ and $Buy^*_{i,t-1 \rightarrow t}$ (without product returns)	1 23	36 64	N A
$Mktg^*_{i,t-1 \rightarrow t}$ and $Buy^*_{i,t-1 \rightarrow t}$ (with product returns)	1 19	35 41	N A
$Mktg^*_{i,t-1 \rightarrow t}$, $Buy^*_{i,t-1 \rightarrow t}$, and PR^*_{it}	1 07	29 74	14 89

Notes N A = not applicable

14 89 Again, this shows that product returns are vital to understanding the exchange process not only when we try to predict product return behavior but also when we predict a firm's decision to allocate resources and a customer's decision to purchase over time

Hypothesis Testing: Antecedents of Product Returns

Gift Products received as gifts were returned less frequently than products not received as gifts, confirming H_1 The coefficient of $Gift_{i,t-1 \rightarrow t}$ was –1 057 This suggests that each additional gift purchased leads to a decrease of approximately $1 06 in product returns per month The reason this happens is likely that products received as gifts have an added value beyond that of the practical utility of the product This added value is a result of the relationship between the gift giver and the gift recipient (Sherry 1983), which causes the recipient to have an additional attachment to the gift, making it less likely to be returned

Holiday Products purchased during the holiday season—in this case, November and December—were significantly more likely to be returned than products purchased during the rest of the year, confirming H_2 The coefficient on $Holiday_{i,t-1 \rightarrow t}$ was 8 366 This means that, on average, for every item purchased during the holiday season, the average dollars in product returns per month increase by $8 37 This suggests not only that more products are purchased during the holiday season but also that the product type and reason for the product purchase are different for the holiday season than for the rest of the year Furthermore, to validate this reason, we examined the data for several customers in the sample For each customer, the products purchased during the months from January to October tended to be repurchases of the same or similar products each year However, in November and December, not only did the customer purchase more products in total, but he or she also purchased products that were previously not purchased both in the same product category and in new product categories

New cross-buy When customers purchased more in new categories than in familiar categories, but in the same distribution channel, they were more likely to return more products The coefficient on $CBNew_{i,t-1 \rightarrow t}$ was 079 This means that for each percentage point increase in the proportion of products purchased in new categories since the last product return, the average monthly product return value increases by $ 08 This matches our expectation in H_3 It shows that as customers increase their purchases from new categories, their product return behavior also increases However, this is not necessarily a troubling finding, because research has shown that as customers shop in more categories, they buy proportionately more than customers who buy only in a single category (Kumar, George, and Pancras 2008)

New channel When customers purchased more in new channels than in familiar channels, but in familiar product categories, they returned fewer products The coefficient on $ChanNew_{i,t-1 \rightarrow t}$ was – 085 This means that for each percentage point increase in the proportion of products purchased in new channels since the last product return, the average monthly product return value decreases by $ 09 This matches our expectation in H_4 When examining the data, we observed that customers who purchased in a new distribution channel but within the same product category were usually purchasing the same products and just shifting the purchase to a new distribution channel This often occurs when customers shift to a new channel with increased convenience or reduced risk

New cross-buy and new channel When a customer purchased more products in new distribution channels and new product categories, there was an increase in product return behavior, confirming H_5 The coefficient on $NewCBCH_{i,t-1 \rightarrow t}$ was 006 This means that for each percentage point increase in the proportion of products purchased in new categories and new channels since the last product return, the average monthly product return value increases by $ 01 Although we find that the relationship is positive, this does not necessarily mean that customers who buy in new product categories and new distribution channels at the same time are bad customers because they return too many products First, even if the customer purchased all products since the past product return in new categories and channels (100%), it means an increase in average monthly product returns of only $1 00 Second, customers who are willing to venture into these new and unfamiliar areas are also more likely to increase their spending at a higher rate than customers who purchase only in familiar channels or categories (Kumar, George, and Pancras 2008, Venkatesan, Kumar, and Ravishanker 2007)

Items on sale Customers who purchased products on sale returned fewer products than customers who purchased products at regular price The coefficient on $\text{SaleItems}_{i,t-1 \to t}$ was –1 264 This means that for each item purchased on sale, the average value of products returned per month decreased by $1 26 This result matched our expectation in H_6 Customers who buy products on sale perceive less value in the product, which is likely to decrease the chance that the postpurchase utility becomes negative, resulting in fewer returns

Hypothesis Testing: Consequences of Product Returns

Buy The amount of products a customer returns now positively affects (up to a threshold) the number of products he or she purchases in the future, confirming H_7 The coefficient on PR^{*}_{it} was 393, and the coefficient on $(PR^{*2}_{it})^{1/3}$ was – 062 Thus, for every $1 00 increase in average monthly product return behavior, there is an increase (up to a threshold) of approximately $ 39 in customer purchase behavior, which begins to decrease at a slow rate for each additional $1 00 of products returned This means that customers who return a moderate amount of products tend to purchase the largest amount of products in the future This adds to the empirical evidence in the marketing literature that shows a positive relationship between product return behavior and customer lifetime value (Venkatesan and Kumar 2004) The implications of this finding can be significant to managers with regard to return policy leniency (Wood 2001) and the optimal level of "hassle" in the product return process (Davis, Hagerty, and Gerstner 1998) This does not necessarily mean that lenient return policies are always ideal, but for this retailer, return policy leniency has a desirable effect on a customer's future purchase behavior The satisfaction received through a free-based product return leads a customer to feel less risk, providing the firm another positive "touchpoint" to build the relationship [3]

Marketing The amount of products a customer returns negatively affects (up to a threshold) the number of catalogs a customer receives, confirming H_8 The coefficient on $PR^{*}_{i,t-1}$ was – 026, and the coefficient on $(PR^{*2}_{i,t-1})^{1/3}$ was 046 This means that each increase of $1 00 of average monthly product returns causes the firm to send approximately 026 fewer catalogs per month, up to a threshold Although this is a fairly small effect, it still shows that as a customer returns more products, the firm reduces the number of catalogs the customer receives The potential pitfall of this decision lies in the finding that the amount of products returned has a positive effect on the customer's future buying behavior (see H_7) As a result, reducing the marketing resources to customers who return too many products also potentially reduces the number of products these customers will purchase in the future The firm could be realizing a suboptimal amount of value from its customers To fix this problem, the decision to allocate resources should not be based independently on the amount of purchases a customer makes or the amount of products a customer returns but rather on maximizing the difference in value between the amount of products purchased and the amount of products returned

Are Product Returns a Necessary Evil?

Although product returns cost the firm in terms of both profits from sales and reverse logistics, this study also empirically shows that up to a threshold, increases in product return behavior increase future customer purchase behavior To understand the impact of these findings fully, it is also important to understand how increases and decreases in customer product return behavior affect firm profits Thus, it is necessary to understand exactly what the tradeoff is between customer product return behavior and firm profits In the process, we can also determine exactly what level of product returns maximizes profits for the focal firm of this study To do this, we used the data from Cohort 1 to simulate the impact of changes in customer product return behavior on firm profits We first computed the discounted firm profit from this sample of customers as follows

$$\text{Firm profit} = \left[(\text{Purchase value} \times \text{margin}) - \text{Cost of product return} - \text{Marketing costs}\right] / \left[\text{Discount rate } (15\%)\right],$$

where

Firm profit = the total discounted profit from a given set of customers,
Purchase value × margin = the total profit from all purchases from customers in the sample,
Cost of product return = the total profit lost from product returns from customers in the sample (i e , loss of sales revenue and cost of reverse logistics [return shipping]),
Marketing costs = the total costs of marketing to all customers in the sample, and
Discount rate = 15% per annum (each profit from purchase, cost of product return, and marketing cost was discounted to present value in the first year of the sample of customers)

We then allowed the overall percentage of the products returned by all customers in Cohort 1 to increase and decrease from the original percentage of product returns, which was 16% According to the current level of product returns, the 1572 customers in Cohort 1 provide a discounted profit of $91,829 (see Table 7) After varying the amount of product returns each customer made, we found

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[3] A free-based product return means that the customer pays no cost to the store to return the product

TABLE 7
The Effect of Changes in Product Returns on Firm Profits

Change in Product Return Amount	Firm Profits (Cohort 1 – n = 1572)	Firm Profits (Customer Base – n = 1 million)
–15%	$63,937	$40 7 million
–10%	$81,551	$51 9 million
–5%	$92,151	$58 6 million
–3%	*$93,567*	*$59 5 million*
0%	$91,829	$58 4 million
5%	$76,222	$48 5 million
10%	$40,504	$25 8 million
15%	($20,608)	($13 1 million)

Notes Italics indicate highest level of profit

that the optimal percentage of product returns that maximize firm profits was 13%, or a decrease in product returns by 3% from the current level

The results of this analysis show that though the current amount of product returns is not at the optimal point, the firm is only 3% away from the optimal amount of product returns to maximize profits and that the optimal amount of product returns is not close to 0% In addition, Table 7 shows that decreases in product returns beyond 13% decrease profits slowly, at 1%, or 15% below the current amount of product returns, profit is $63,937 However, increases in product returns significantly decrease profits, at 31%, or 15% above the current amount of product returns, profit is –$20,608

However, the results of this analysis should not be applied directly to a change in the focal firm's product return policy to try to decrease product returns from 16% to 13% Changing the product return policy is also likely to change customer buying behavior both before purchase and after product return (Nasr-Bechwati and Siegal 2005, Wood 2001) To determine an optimal product return policy, the firm would need to determine how changes in product return policies affect customer purchase behavior Instead, to reduce product returns to the optimal level, the results of this simulation can provide insights for the firm to implement marketing campaigns to help decrease customer product return behavior This can be done using the antecedents of product return behavior as levers for increasing each customer's profitability by maximizing the difference between products purchased and products returned

Implications

The main contribution of this article is in showing that product returns are inevitable but by no means evil We show this in the following three ways

1 A customer's product return behavior positively affects his or her future buying behavior, up to a threshold
2 Including product returns in the analysis of the firm–customer exchange process as an independent and dependent variable increases the accuracy with which we can predict a customer's buying behavior, a customer's product return behavior, and a firm's decision to allocate marketing resources
3 Allowing for a moderate amount of product returns, given the current return policy by the focal firm of the study (13%), maximizes firm profits

In addition, the other significant contribution of this article is the use of the SUR Tobit model, which enabled us to model simultaneously a customer's product return and buying behavior and a firm's decision to allocate resources By modeling the three aspects of the firm–customer exchange process together and accounting for the censored/truncated nature of the data, we can remove any potential biases that may be inherent in the data and/or modeling application

In some cases, when a customer's return experiences are positive (e g , a customer can return a product relatively easily and hassle free), this offers the retailer a chance to build the relationship with the customer and reap positive behavioral outcomes These outcomes can include, but are not limited to, increases in spending/revenue, customers' willingness to pay price premiums, and customers' willingness to refer new customers to the retailer (Zeithaml, Berry, and Parasuraman 1996) These behavioral outcomes all have direct effects on the company's bottom line, whether through increasing customer lifetime value (i e , increases in spending/revenue and price premiums) or by increasing customer equity by retaining customers who tend to refer additional customers to purchase (Hogan, Lemon, and Libai 2003, Kumar, Petersen, and Leone 2007)

Currently, many retailers do not include product returns as a key part of their customer relationship management strategy and often view product returns as a hassle to the business and a drain on the supply chain As a result, many firms make efforts to streamline their supply chains to reduce the impact of product returns on the bottom line However, managers often ignore or try to dissuade customer product return behavior As we noted previously, this lack of understanding of how product returns affect the exchange process has led managers to make suboptimal decisions in the allocation of marketing resources However, this problem can be fixed by observing what helps describe a customer's product return behavior and, in turn, how product return behavior affects the customer's future buying behavior Only then will managers be able to determine the potential impact of the mismanagement of customer product returns on customer buying behavior over time

When retailers provide an environment for returning products that satisfies customers, regardless of the leniency of the return policy, this can lead the customers to perceive less risk in making purchases (Bower and Maxham 2006) This happens because customers understand the role of the return policy in the evaluation of the product before purchase (Anderson, Hansen, and Simester 2009, Nasr-Bechwati and Siegal 2005) Subsequently, this can lead to higher levels of customer trust and commitment and even to stronger behavioral and attitudinal loyalty (Morgan and Hunt 1994) As a result of stronger attitudinal loyalty, the customer is likely to purchase even more from the firm because he or she is comfortable returning any product that does not fit his or her needs (Reinartz and Kumar 2002)

In addition, there are many other positive consequences of a customer perceiving less risk when building a relationship with a firm that can create additional customer welfare or goodwill For example, customers who perceive less risk when making purchases can be candidates for cross-buying (Kumar, George, and Pancras 2008) and multichannel shopping (Venkatesan, Kumar, and Ravishanker 2007), both of which have been shown to lead to an incrementally higher customer lifetime value This research shows that though it likely costs more in the short run for a firm to have a lenient product return policy, in the long run, retailers and managers can use information from each customer's product return behavior as a tool for realizing long-term relationship growth and maximizing each customer's profitability Thus, managers can actively use information about product returns as a metric for managing customer value and, in turn, can maximize each customer's value to the firm by implementing marketing campaigns targeted at the right customers at the right time

Limitations and Further Research

Although the results of this study were based on a single firm's lenient product return policy, all managers should not necessarily view leniency as the best return policy The specific retailer in this study prides itself on product quality and expects that because of its high product quality, customers will return fewer products in total For some discount retailers, offering products at the lowest price may be the top priority As a result, if discount firms have a lower product quality, an extremely lenient return policy may cause the number of product returns to increase to a point at which business becomes unprofitable In such cases, firms may find that an ideal return policy is one that offers some disincentives to return products, such as a restocking fee or a limitation on the number of days after purchase To help determine the optimal product return policies across different firms, further research should consider data across several different firms with varying product return policies This will help shed light on optimal return policies for different types of firms (business to consumer versus business to business), different types of industries (e g , high-tech versus apparel), stores with different characteristics (e g , catalog versus bricks-and-mortar), and stores that sell across many different product categories (Anderson, Hansen, and Simester 2009)

In addition, our findings suggest that because product returns are positively related (up to a threshold) to future purchase behavior and negatively related (up to a threshold) to the firm's decision to allocate resources, the firm is likely allocating resources suboptimally However, this study is descriptive in nature, and though its implications to marketing are broad, further research is necessary if a manager wants to use information on buying behavior, product return behavior, and past marketing communications to allocate marketing resources optimally to maximize future customer profitability

Appendix A
Details on Cube Root Power Transformation

When we augmented the original censored and truncated endogenous variables to estimate the model, the new augmented variable in the linear case was distributed normally However, when we square this variable, the result is heavily skewed to the right This occurs because all the values that were previously zero are now negative in the linear case and positive in the squared case The result is a variable that is significantly right skewed compared with the case in which the original variable is squared To correct for this problem, we can use a power transformation to improve normality and reduce skewness

In the case of data that are distributed chi-square (as is the case when the augmented variable is squared), it is common to use a cube root transformation of the given variable to induce normality (Chen and Deo 2004) Thus, after squaring the augmented data, we take the cube root of the value and use the transformed value as an independent variable We found that this transformation significantly reduced the right skewness of the data

The parameter estimates we obtain cannot be transformed back in the same way We need to interpret the results of the transformed variable and use the transformed variable in prediction In the case of this study, the variable being transformed using a cube root power transformation was distributed chi-square Thus, if we observe a negative parameter estimate on the transformed variable with a positive parameter estimate on the linear augmented variable, it suggests that a saturation effect is occurring Because we are not transforming the parameter estimate back to the original variable, the size of the effect is difficult to interpret However, the sign of the parameter estimate can be interpreted in the same way as the original variable, given that we are taking a cube root of the original variable that was distributed chi-square

Appendix B

Estimation Algorithm: The SUR Tobit Model

We estimate the latent class SUR Tobit model using an adaptation of the MCECM algorithm as described by Huang (1999) Consider the general case of the SUR Tobit model, in which there are p regressions with n observations

$$\text{(B1)}\quad y^*_{ij} = X'_{ij}\beta_i + \varepsilon_i,\ 1 \le i \le p,\ 1 \le j \le n,\ \varepsilon_i \sim \text{iid}N_p(0, \Omega)$$

$$y_{ij} = \begin{cases} y^*_{ij} & \text{if } y^*_{ij} > 0 \\ 0 & \text{if } y^*_{ij} \le 0 \end{cases},$$

where in the case of this study,

$$\text{(B2)}\qquad y^*_{ij} = \begin{bmatrix} \text{PR}^*_{i,t} \\ \text{Buy}^*_{i,t-1\to t} \\ \text{MKTG}^*_{i,t-1\to t} \end{bmatrix},$$

$$X_{ij} = \begin{bmatrix} x^{PR} & 0 & 0 \\ 0 & x^{Buy} & 0 \\ 0 & 0 & x^{MKTG} \end{bmatrix},\ \varepsilon_i = \begin{bmatrix} \varepsilon_{PR} \\ \varepsilon_{Buy} \\ \varepsilon_{MKTG} \end{bmatrix}$$

MCECM Algorithm

1 MCE step The MCE step, or Monte Carlo expectation step, is used in place of the E step in the expectation-maximization (EM) algorithm As a result, the Q function from the MCE step for the general case of the SUR Tobit is estimated as the ergodic average

$$\text{(B3)}\qquad Q\left[(\beta, \Omega),(\beta^{(i)}, \Omega^{(i)})\right] = -\frac{np}{2}\ln(2\pi) - \frac{n}{2}\ln|\Omega|$$

$$+\frac{1}{N}\sum_{k=1}^{N}\left[-\frac{1}{2}\sum_{j=1}^{n}(y_{ij}^{*} - X_j\beta)'\Omega^{-1}(y_{ij}^{*} - X_j\beta)\right],$$

where values of y_{ij} that equal 0 are replaced by values drawn from a truncated normal distribution with mean $X_j\beta$ and variance Ω [$TN_{(-\infty,\, 0)}(X_j\beta, \Omega)$] This Q function will converge to its true value as N approaches infinity

2 CM step The CM step, or conditional maximization step, is performed by the maximization of β given Ω and of Ω given β This is done by iteratively updating the values of β and Ω, such that

$$\text{(B4)}\qquad \beta^{(i+1)} = \left(\sum_{j=1}^{n} X_j'\Omega^{-1}X_j\right)^{-1}\left(\sum_{j=1}^{n} X_j'\Omega^{-1}\bar{y}_j\right),$$

$$\bar{y} = \frac{1}{N}\sum_{k=1}^{N} y_j^{*(k)},$$

$$\text{(B5)}\qquad \Omega^{(i+1)} = \frac{1}{N}\sum_{k=1}^{N}\sum_{j=1}^{n}\left(y_j^{*(k)} - X_j\beta\right)\left(y_j^{*(k)} - X_j\beta\right)'$$

Appendix C
Latent Class Segmentation

The latent class segmentation of the customers into m homogeneous segments can be carried out as follows We assume that there are somewhere between 1 and M homogeneous segments, where M is the number of customers or households in the data set Each segment will have the following relative size

$$\text{(C1)}\qquad f_m = \frac{\exp(\lambda_m)}{\sum \exp(\lambda_m)},$$

where f_m is the size of segment m as a percentage of total population size

The likelihood of the latent class segmentation model can be computed as follows

$$\text{(C2)}\qquad L(Q) = \sum_{m}\left[\frac{\exp(\lambda_m)L(Q|m)}{\sum_{m}\exp(\lambda_m)}\right],$$

where L(Q|m) is the expectation of the Q function given that the segment membership is m

We carry out this latent class segmentation of customers, hypothesizing that there are more than one latent segment of customers in the data We do this by setting the number of segments to different numbers (1, , m) and then determining how many latent segments are uncovered We attempted a one-, two-, three-, and four-segment solution The results we obtained are as follows

Results from the Latent Class Analysis

Number of Segments	Segment Size	–2 × Log-Likelihood	CAIC
1	100%	16,349	**16,676**
2	95% and 5%	16,159	16,813
3	80%, 13%, and 7%	15,996	16,997
4	68%, 14%, 11%, and 7%	15,761	17,069

We chose the model (noted in bold font) with the lowest CAIC (16,676) for the optimal number of segments (Jedidi, Ramaswami, and DeSarbo 1993) Thus, we select one segment as the optimal number of segments for this latent class analysis The CAIC is an alternative measure to the AIC that corrects for the overestimation bias in AIC by penalizing for overparameterization It is defined as follows

$$CAIC_m = -2 \times \ln[L(Q|m)] + N_m(\ln I + 1),$$

where

$L(Q|m)$ = the likelihood of the model given segment m,
N_m = the effective number of parameters estimated in an m-class solution, and
I = the number of observations in the sample

A one-segment solution means that there is no significant benefit to segmenting customers into multiple latent segments However, a one-segment solution does not mean that there is no variation between segments It means only that the additional variance explained by dividing customers into multiple segments is outweighed by the reduction in parsimony from the use of too many parameters In addition, it suggests that the variables used in the three models explained much of the heterogeneity among customers

The parameter estimates for each of the four latent class estimations (one, two, three, and four segments) showed only slight differences between each segment in each of the models, both in magnitude and significance (Parameter estimates for the two-, three-, and four-segment solutions are available on request) However, in almost no cases did we observe the signs of the parameter estimates change As a result, the slight, but not significant, increase in variance explained when each additional segment is added leads to the one-segment solution having the lowest CAIC

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J. Joško Brakus, Bernd H. Schmitt, & Lia Zarantonello

Brand Experience: What Is It? How Is It Measured? Does It Affect Loyalty?

Brand experience is conceptualized as sensations, feelings, cognitions, and behavioral responses evoked by brand-related stimuli that are part of a brand's design and identity, packaging, communications, and environments. The authors distinguish several experience dimensions and construct a brand experience scale that includes four dimensions: sensory, affective, intellectual, and behavioral. In six studies, the authors show that the scale is reliable, valid, and distinct from other brand measures, including brand evaluations, brand involvement, brand attachment, customer delight, and brand personality. Moreover, brand experience affects consumer satisfaction and loyalty directly and indirectly through brand personality associations.

Keywords: experience marketing, brand experience, customer experience management, scale development, marketing communications

How do consumers experience a brand? How is brand experience measured? Does brand experience affect consumer behavior? Many useful constructs and measurements have been developed recently in the branding literature, including brand personality, brand community, brand trust, brand attachment, and brand love (Aaker 1997, Carroll and Ahuvia 2006, Delgado-Ballester, Munuera-Alemán, and Yague-Guillén 2003, McAlexander, Schouten, and Koenig 2002, Thomson, MacInnis, and Park 2005). However, a conceptualization and scale for measuring brand experiences has not yet been developed. In addition, research has studied contexts in which specific product and service experiences arise (Arnould, Price, and Zinkhan 2002). However, research has largely ignored the exact nature and dimensional structure of brand experiences.

Notably, brand experience has attracted a lot of attention in marketing practice. Marketing practitioners have come to realize that understanding how consumers experience brands is critical for developing marketing strategies for goods and services. Many trade writings have appeared that present useful concepts as well as some ad hoc experience measurements (Chattopadhyay and Laborie 2005, Pine and Gilmore 1999, Schmitt 1999, 2003, Shaw and Ivens 2002, Smith and Wheeler 2002).

In this article, we present both a conceptual analysis of brand experience and a brand experience scale. As with other brand research, the development of a brand experience scale must go hand-in-hand with conceptual development of the construct itself. We need to identify the underlying dimensions of brand experience (analogous to the "Big Five" dimensions of brand personality or the dimensions of affection, connection, and passion that make up brand attachment) and develop a scale that can measure the strength with which a brand evokes each experience dimension. However, the experience construct is not as clearly associated with one particular basic discipline (e.g., psychology) as other brand constructs are. For example, brand personality and brand attachment have been defined on the basis of equivalent concepts in personality and developmental psychology, as a result, the development of scale items was relatively straightforward. In contrast, writing on experience can be found in a wide range of fields, including marketing, philosophy, cognitive science, and management practice. Therefore, we must clearly conceptualize our construct and develop scale items based on this conceptualization.

To define and conceptualize the brand experience construct, we begin with a review of consumer and marketing research, which examines when experiences occur and how they affect judgments, attitudes, and other aspects of consumer behavior. Next, we review the literature in philosophy, cognitive science, and applied management to distinguish brand experience dimensions and develop a brand experience scale. We then examine the psychometric properties of the scale using standard scale validation procedures. Finally, we test whether brand experience affects consumer satisfaction and loyalty.

The Experience Concept in Consumer and Marketing Research

Consumer and marketing research has shown that experiences occur when consumers search for products, when they shop for them and receive service, and when they consume them (Arnould, Price, and Zinkhan 2002, Brakus, Schmitt, and Zhang 2008, Holbrook 2000). We discuss each in turn.

Product Experience

Product experiences occur when consumers interact with products—for example, when consumers search for products and examine and evaluate them (Hoch 2002). The product experience can be direct when there is physical

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contact with the product (Hoch and Ha 1986) or indirect when a product is presented virtually or in an advertisement (Hoch and Ha 1986, Kempf and Smith 1998) Respondents are typically asked to reflect on a combination of direct and indirect product experiences to investigate how the combination affects product judgments, attitudes, preferences, purchase intent, and recall (Hoch and Deighton 1989, Hoch and Ha 1986, Huffman and Houston 1993)

Shopping and Service Experience

Shopping and service experiences occur when a consumer interacts with a store's physical environment, its personnel, and its policies and practices (Hui and Bateson 1991, Kerin, Jain, and Howard 2002) Thus, research in this area investigates how atmospheric variables and salespeople affect the experience (Arnold et al 2005, Boulding et al 1993, Jones 1999, Ofir and Simonson 2007) Several articles have investigated customers' interaction with salespeople and how that experience affects customers' feelings, brand attitudes, and satisfaction (Grace and O'Cass 2004)

Consumption Experience

Experiences also occur when consumers consume and use products Consumption experiences are multidimensional and include hedonic dimensions, such as feelings, fantasies, and fun (Holbrook and Hirschman 1982) Much of the interpretive research on consumption experiences has analyzed hedonic goals that occur during and after the consumption of, for example, museums, river rafting, baseball, and skydiving (Arnould and Price 1993, Celsi, Rose, and Leigh 1993, Holt 1995, Joy and Sherry 2003)

In summary, experiences arise in a variety of settings Most experiences occur directly when consumers shop, buy, and consume products Experiences can also occur indirectly—for example, when consumers are exposed to advertising and marketing communications, including Web sites

Conceptualizing Brand Experience

Most of the research on experiences to date has focused on utilitarian product attributes and category experiences, not on experiences provided by brands When consumers search for, shop for, and consume brands, they are exposed to utilitarian product attributes However, they are also exposed to various specific brand-related stimuli, such as brand-identifying colors (Bellizzi and Hite 1992, Gorn et al 1997, Meyers-Levy and Peracchio 1995), shapes (Veryzer and Hutchinson 1998), typefaces, background design elements (Mandel and Johnson 2002), slogans, mascots, and brand characters (Keller 1987) These brand-related stimuli appear as part of a brand's design and identity (e g , name, logo, signage), packaging, and marketing communications (e g , advertisements, brochures, Web sites) and in environments in which the brand is marketed or sold (e g , stores, events) These brand-related stimuli constitute the major source of subjective, internal consumer responses, which we refer to as "brand experience"

Thus, we conceptualize brand experience as subjective, internal consumer responses (sensations, feelings, and cognitions) and behavioral responses evoked by brand-related stimuli that are part of a brand's design and identity, packaging, communications, and environments In the following sections, we explicate the brand experience construct further and differentiate it from other brand concepts Most important, we distinguish various dimensions of brand experience

Further Explication of the Brand Experience Construct

Brand experiences vary in strength and intensity, that is, some brand experiences are stronger or more intense than others As with product experiences, brand experiences also vary in valence, that is, some are more positive than others, and some experiences may even be negative Moreover, some brand experiences occur spontaneously without much reflection and are short-lived, others occur more deliberately and last longer Over time, these long-lasting brand experiences, stored in consumer memory, should affect consumer satisfaction and loyalty (Oliver 1997, Reicheld 1996)

Differences Between Brand Experience and Other Brand Constructs

Brand experience is related but also conceptually distinct from other brand constructs In particular, brand experience differs from evaluative, affective, and associative constructs, such as brand attitudes, brand involvement, brand attachment, customer delight, and brand personality

Attitudes are general evaluations based on beliefs or automatic affective reactions (Fishbein and Ajzen 1975, Murphy and Zajonc 1993) In contrast, brand experiences are not general evaluative judgments about the brand (e g , "I like the brand") They include specific sensations, feelings, cognitions, and behavioral responses triggered by specific brand-related stimuli For example, experiences may include specific feelings, not just an overall "liking" At times, experiences may result in general evaluations and attitudes, especially evaluations of the experience itself (e g , "I like the experience") However, the overall attitude toward the experience captures only a small part of the entire brand experience

Brand experience also differs from motivational and affective concepts, such as involvement (Zaichkowsky 1985), brand attachment (Thomson, MacInnis, and Park 2005), and customer delight (Oliver, Rust, and Varki 1997) Involvement is based on needs, values, and interests that motivate a consumer toward an object (e g , a brand) Antecedents of involvement include the perceived importance and personal relevance of a brand (Zaichkowsky 1985) Brand experience does not presume a motivational state Experiences can happen when consumers do not show interest in or have a personal connection with the brand Moreover, brands that consumers are highly involved with are not necessarily brands that evoke the strongest experiences

If involvement can be characterized by mild affect, brand attachment refers to a strong emotional bond (i e , "hot affect") between a consumer and a brand, as evidenced by its three dimensions—affection, passion, and connection

(Park and MacInnis 2006, Thomson, MacInnis, and Park 2005) In contrast to brand attachment, brand experience is not an emotional relationship concept As we described previously, experiences are sensations, feelings, cognitions, and behavioral responses evoked by brand-related stimuli Over time, brand experiences may result in emotional bonds, but emotions are only one internal outcome of the stimulation that evokes experiences

As with brand attachment, customer delight is characterized by arousal and positive affect, it can be considered the affective component of satisfaction (Oliver, Rust, and Varki 1997) Customer delight results from disconfirming, surprising consumption (Oliver, Rust, and Varki 1997) In contrast to customer delight, brand experiences do not occur only after consumption, they occur whenever there is a direct or indirect interaction with the brand Moreover, a brand experience does not need to be surprising, it can be both expected or unexpected

Finally, brand experience is distinct from brand associations and brand image (Keller 1993) One of the most studied constructs of brand associations is brand personality (Aaker 1997) Consumers tend to endow brands with human characteristics that result in a brand personality, which consists of five dimensions—sincerity, excitement, competence, sophistication, and ruggedness (Aaker 1997) Brand personality is based on inferential processes (Johar, Sengupta, and Aaker 2005) That is, consumers are not sincere or excited about the brand, they merely project these traits onto brands In contrast, brand experiences are actual sensations, feelings, cognitions, and behavioral responses Thus, because brand experience differs from brand evaluations, involvement, attachment, and customer delight, brand experience is also conceptually and empirically distinct from brand personality

Dimensions of Brand Experience

To identify dimensions of brand experience, we next review pertinent work in philosophy, cognitive science, and applied writings on experiential marketing and management In this literature, across a variety of disciplines, a fairly consistent set of experience dimensions, which are highly relevant to brands, has been proposed

Philosophical Investigations

The philosopher John Dewey (1922, 1925) views experience as the intertwining of human beings and their environments He critiques the purely cognitive Kantian view of experience as knowledge, arguing that knowledge (classifying, analyzing, and reasoning about things) is only one part of a person's understanding of the world In addition to intellectual experiences resulting from knowledge, experiences also include perceiving (through the senses), feeling, and doing Moreover, human beings are fundamentally connected with other people Following Dewey, Dubé and LeBel (2003) distinguish four "pleasure dimensions" intellectual, emotional, social, and physical pleasures

Cognitive Science

Cognitive scientists have investigated "mental modules," or special purpose computational systems that respond to specific environmental cues and solve a restricted class of problems (Fodor 1998) Pinker (1997) identifies four mental modules that correspond closely to the experiences that Dewey (1922, 1925) postulates sensory perception, feelings and emotions, creativity and reasoning, and social relationships However, Pinker does not list a separate "doing" module, he considers bodily experiences and motor actions and behaviors part of the "sensory-motor module," similar to Lakoff and Johnson's (1999) concept of embodied cognition

Applied Writings on Experience Marketing and Management

Pine and Gilmore (1999) study "staged experiences" in retail environments and events For these settings, they distinguish aesthetic (including visual, aural, olfactory, and tactile aspects), educational, entertaining, and escapist experiences Although Pine and Gilmore's framework is limited to retail settings and events, their four experience dimensions nonetheless overlap with some of the dimensions of experience we discussed previously, thus confirming the need for conceptualizing a sensory/aesthetic, intellectual/educational, and emotional/entertaining dimension

Schmitt (1999) proposes five experiences sense, feel, think, act, and relate The sense experience includes aesthetics and sensory qualities Consistent with recent research in consumer behavior (Richins 1997), the feel experience includes moods and emotions The think experience includes convergent/analytical and divergent/imaginative thinking The act experience refers to motor actions and behavioral experiences Finally, the relate experience refers to social experiences, such as relating to a reference group The five experiences are closely related to Dewey's (1922, 1925) categorization, Dubé and LeBel's (2003) pleasure construct, and Pinker's (1997) mental modules, especially if we view Pinker's sensory module as including sensory and behavioral components

Summary

There has been considerable agreement in the categorization of experiences by philosophers, cognitive scientists, and management thinkers Therefore, for the scale development that follows, it is necessary to generate items along the five experience dimensions that broadly emerged from our literature review sensory, affective, intellectual, behavioral, and social

In line with our conceptualization, the experience dimensions are evoked by brand-related stimuli (e g , colors, shapes, typefaces, designs, slogans, mascots, brand characters) Note that there is no one-to-one correspondence, such that a certain stimulus type would trigger a certain experience dimension and only that dimension For example, although colors, shapes, typefaces, and designs usually result in sensory experience, they may also result in emotions (e g , red for Coca-Cola) or intellectual experiences (e g , when designs use complex patterns) Similarly, although slogans, mascots, and brand characters may result in imaginative thoughts, they may also trigger emotions (e g , "Bibendum," the Michelin Man) or stimulate actions (e g , Nike's "Just Do It") In addition, when consumers complete brand experience scales, such scales are usually not directly assessing the dynamic, "online" experience of the consumer in the here and now, rather, such scales typically assess a lasting trace stored in long-term memory based on multiple exposures to brand-related stimuli

Before we develop the actual scale, we first report the results of an exploratory, qualitative study that we designed to determine whether the conceptualization of brand experience presented here was in line with consumers' conceptions of brand experience

Consumers' Conceptions of Brand Experience

Are consumers' conceptions of experience similar to our conceptualization? To address this question, we asked graduate-level business students (N = 25) to describe their experience with a brand of their choice We instructed participants to choose a brand that provides a strong experience for them, to list the brand, and then to describe their experience in an open-ended way on one sheet of paper Next, we asked them to choose a brand in the same or a related category that provides a weak experience for them or no experience at all and to describe in an open-ended way the "sensations, feelings, thoughts, and behaviors that they might have or engage in, alone or with others" Note that, given the instructions, participants needed to rely on their own conceptions of experience for the experiential brand, but they were primed with terms related to experience dimensions for the weak experiential brand This allowed for a conservative assessment of whether consumers shared our conception of experience and whether they perceived a difference between strong experiential and weak experiential brands

Participants in the study provided open-ended responses for a variety of goods and service brands They rated the following brands to be strong experiential brands Abercrombie & Fitch, American Express, Apple/iPod (chosen by six respondents), The Body Shop, BMW, Crest, Disney, Google, HBO, Home Depot, MasterCard, Nike (chosen by four respondents), Starbucks, Target, W Hotel, Washington Mutual, and Williams-Sonoma Participants provided descriptions of weak experiential brands for Aéropostale, Canon, Dell, Dick's Sporting Goods, Douglas, Dunkin' Donuts, Hilton, Macy's, Microsoft, Reebok (chosen by two respondents), Sony, Sur La Table, Tim Hortons, True Value, Visa (chosen by two respondents), Volkswagen, and Wal-Mart Some respondents defined "category" more broadly than others (e g , consumer electronics rather than MP3 players) Six respondents did not provide a specific weak experiential brand in the same category but described weak experiential brands in the category generically Although these respondents did not strictly follow instructions, we included their responses to avoid biasing the results

A content analysis of the open-ended responses indicated that all consumers had a concept of brand experience Respondents reported brand experiences that occurred when they shopped and consumed brands They also viewed brand experiences as being evoked by brand-related stimuli For each experiential brand, we asked two raters to select descriptions that corresponded with our conceptualization of sensory, affective, cognitive, behavioral, and social experiences As an illustration, in Table 1, we present three descriptions per strong experiential brand, which had been selected by both raters (For Apple and Nike, which had been selected as strong experiential brands by more than one respondent, we provide six descriptions each) As Table 1 shows, participants provided descriptions of sensations (e g , "touch and feel," "appeal to different senses," "smells nice and is visually warm"), a wide range of feelings (e g , "fun," "refreshed," "inspired," "nostalgia"), analytical and imaginative thoughts (e g , "the brand intrigues me," "I think of topics like animal testing, purity and wellness," "reminds me to use my imagination"), and behaviors (e g , "I change the way I organize and interact with information," "I want to work out," "It's a place I want to go") Participants also made occasional references to the social context of branded experiences (e g , "It's like a membership in an exclusive, country-clubish community," "I am part of a 'smarter' community," "I feel like an athlete") We also analyzed the descriptions for the weak experiential brands In contrast to the strong experiential brands, participants described weak experiential brands mostly in terms of price and promotions, as well as functionality and basics, even though they were explicitly primed with an experiential terminology For example, consider the following descriptions of Wal-Mart, Visa, and Aéropostale "They focus on price as low as price can be, their retail stores are incredibly basic" (for Wal-Mart), "Visa is not about experience Visa promotes being accepted everywhere Visa is about convenience and reliability and less about how I as a customer feel about the brand", "Aéro's brand stands for little more than cheap clothing" (for Aéropostale)

Two other findings are noteworthy First, almost all descriptions of strong experiential brands were positive, only 2 of the 25 respondents provided some negative descriptions (see Table 1) Moreover, many descriptions were at the general level of experiences at which we provided our conceptualization Only 6 respondents provided detailed descriptions of highly specific elements of their experiences—for example, by referring to the colors and design of Apple products, the background music or visual design in stores, or the way a BMW drives ("I love the sensations I get from BMW The noise of the motor during acceleration, the grip on curves, the resistance on the steering wheel when I turn") In summary, the qualitative study shows that consumers' conceptions of brand experience are aligned with the concept of brand experience we developed from prior research and theoretical writings in various disciplines

Developing the Brand Experience Scale

Next, we develop a brand experience scale that captures the dimensions of brand experience and the level of experience

TABLE 1
Descriptions of Experiential Brands

Abercrombie & Fitch
- It's a complete experience when you enter the store
- Stimulates me, sexy
- It's like a membership in an exclusive, country-clubish community

American Express
- It's an interactive experience
- Part of luxury, sophistication, and exclusivity
- Because of sponsoring activities, I feel fun, excitement, and entertainment

Apple/iPod
- I love the touch and feel of the products
- I enjoy playing with all the products
- I am part of a "smarter" community
- This brand intrigues me
- I really feel Apple products go with my way of life
- I use the iPod when I am jogging, and I exercise more because of the iPod

The Body Shop
- Appeals to different senses
- I think of topics like animal testing, purity, and wellness
- I want to be with people that share the values that the brand promotes

BMW
- I feel young, I feel stylish
- It's just great to drive
- A BMW is the symbol of my success

Crest
- I feel refreshed
- Don't really like the smell
- Feels clean, fresh, and healthy

Disney
- Stimulates my senses
- I feel like a child, I feel warm and safe, I want to discover things, the brand reminds me to use my imagination
- I feel part of the magic

Google
- The search is elegant, it creates a mood of playfulness and curiosity
- I feel happy and proud because I am "smart" and "in-the-know"
- With Google, I change the way I organize and interact with information

HBO
- Puts me in a good mood
- It's "discussion inducing", I want to discuss the shows with others
- I enjoy the entertainment

Home Depot
- I did not know anything about construction, but I felt really comfortable
- I felt confident and in good hands
- Provides the experience that any customer can tackle any home improvement project

MasterCard
- Makes me think about precious things in life
- I feel more youthful than using American Express or Visa
- Initially the "Priceless" campaign was emotive, but it's now simply a way of identifying the brand for me

Nike
- Makes me think of how to live an active lifestyle
- Makes me feel powerful
- I want to work out
- I feel inspired to start working out
- I feel like an athlete
- The store incites me to act, like swing the baseball bat, or put on the running shoes
- I enjoy designing my own shoe that perfectly fits my personality

Starbucks
- Smells nice and is visually warm
- It's comfortable and puts me in a better mood
- It's like being around a Barnes & Nobles crowd

Target
- Shopping experience is very pleasant
- Products are displayed to please the eye
- Many stores are putting in Starbucks for an even more enhanced shopping experience

W Hotel
- Being part of something fun, happening, and exciting
- It was an amazing feeling to hang out in the lobby
- Service is disappointing

Washington Mutual
- I have positive feelings because of their friendliness
- It's a place I want to go and do not have to go
- I also had a negative one-time experience

Williams-Sonoma
- I had a feeling of nostalgia
- Full of memories of home
- It's relaxed and unhurried

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evoked by the brand on each dimension As part of the scale development, we must address methodological challenges First, in contrast to some other brand scales adopted from existing scales in psychology, the development of a brand experience scale requires a broader search for acceptable items Second, the items of the scale should focus on the degree to which a consumer has a sensory, affective, intellectual, behavioral, or social experience with a brand, they should not measure the specific sensory, affective, intellectual, behavioral, or social content of the experience (e g , whether the experience is visually exciting or emotionally warm, what specific imaginary thoughts or behavioral actions come to mind) Several scales already provide highly specific measures for specific experiences, such as the visual product aesthetics scale (Bloch, Brunel, and Arnold 2003), emotions scales (Izard 1978), or the need-for-cognition scale (Cacioppo and Petty 1982) These scales focus on individual reactions to specific stimuli (e g , well-designed products) or tasks (e g , abstract thinking) They use multifaceted items to measure specific sensations (e g , "I enjoy seeing displays of products that have superior design", "When I see a product that has a really great design, I feel a strong urge to buy it", Bloch, Brunel, and Arnold 2003), specific emotions (e g , "affectionate," "attached," "passionate", Thomson, MacInnis, and Park 2005), or specific intellectual processes (e g , "I would prefer complex to simple problems," "The notion of thinking abstractly appeals to me", Cacioppo and Petty 1982) Although reviewing such scales is important, the specific items on these scales are of limited value given our objective of measuring more generally whether and to what degree a consumer has a sensory, affective, intellectual, behavioral, or social experience

In Study 1, we conduct an extensive literature review, select initial items along the five proposed dimensions, and ask experts and consumers to screen these items In Study 2, we ask consumers to rate 21 brands on the remaining items of Study 1, and we conduct an exploratory factor analysis to determine the dimensionality of the scale, moreover, we show that the scale has criterion validity In Study 3, using a shorter scale and a new sample of consumers and brands, we use exploratory and confirmatory factor analyses to further determine the scale dimensionality In Study 4, we examine the dimensionality of the scale with a nonstudent population, in addition, we show that brand experience is distinct from general brand evaluations and that the scale is reliable over time Finally, in Study 5, we examine the discriminant validity of the scale from motivational and affective brand scales, such as brand involvement, brand attachment, and customer delight

Study 1: Item Generation and Selection

The objective of Study 1 was to generate specific items for the proposed dimensions of brand experience and to select the items that have face validity in terms of describing relevant brand experiences To generate the items, we conducted an extensive literature search and review focused on concepts related to the five dimensions of experience For sensory experiences, we examined research related to aesthetics and sensory perceptions (Arnheim 1974, Berlyne 1974, Bloch, Brunel, and Arnold 2003, Parsons and Conroy 2006, Schmitt and Simonson 1997) For affective experiences, we reviewed the literature on affect and emotions in psychology and consumer research (Edell and Burke 1987, Izard 1978, Plutchik and Kellerman 1989, Richins 1997) For intellectual experiences, we reviewed research on intelligence and cognitive style and literature on creative thinking and applications of creative thinking in advertising (Guilford 1956, Smith and Yang 2004) For behavioral experiences, we reviewed the literature on physical/behavioral and lifestyles aspects of consumption (Helman and De Chernatony 1999, Solomon 2004) Finally, for social experiences, we reviewed the literature on brand communities and relationships (Fournier 1998, McAlexander, Schouten, and Koenig 2002, Muniz and O'Guinn 2001)

From the literature review, we selected or constructed 131 items to refer to sensory impressions and appeals (25 items), feelings, sentiments, and emotions (30 items), curiosity, thinking, and problem solving (26 items), physical and bodily actions and behaviors (25 items), and relationships and belonging (25 items) Some of the selected items needed to be reworded to create linguistic style consistency for the scale so that the word "brand" appeared in each item and referred to or implied a consumer experience with the brand We then included the items in a questionnaire in random order After the initial screening and face validity check, we retained 125 applicable items 24 sensory, 29 affective, 26 intellectual, 23 behavioral, and 23 social items

Next, 30 university students were paid $5 each to participate in a study on brand experience We modeled instructions after the work of Thomson, MacInnis, and Park (2005) After explaining the concept of brand experience, we asked the participants to evaluate the extent to which the 125 items described their experiences with brands, using a seven-point Likert scale (1 = "not at all descriptive," and 7 = "extremely descriptive") One-third of the items were negatively worded We retained items with a mean value greater than 4 0 and a standard deviation less than 2 0, for a total of 83 items 23 (7 negative) for sensory, 13 (7 negative) for affective, 10 (8 negative) for intellectual, 18 (7 negative) for behavioral, and 19 (7 negative) for social experiences

Study 2: Item Reduction and Dimensionality of the Scale

We designed Study 2 to reduce the number of items and to examine two questions

1 How many brand experience dimensions are there?
2 What experiences are captured by these dimensions?

In a pretest, we asked 68 university students to think of three product categories and to pick one brand in each category that they believed was marketed in an experiential way and another brand that they believed was not marketed in an experiential way We retained brands with the highest frequency of mention, for a total of 21 brands (16 experiential and 5 nonexperiential) The chosen experiential brands were (frequencies of mention are in parentheses) Apple (13), Nike (10), Whole Foods (9), BMW (8), Sony (5), JetBlue (5), Tiffany (4), Virgin (4), Target (4), McDonald's (4), Coca-Cola (4), Abercrombie & Fitch (4), Reebok (4), W Hotels (4), Barnes & Noble (4), and Starbucks (4) The nonexperiential brands were Wal-Mart (7), IBM (6), Gristedes (5), Poland Spring (4), and Dell (4)

In the main study, we asked a new sample of students (N = 267) to indicate the extent to which the 83 items described their experiences with each of five brands listed (1 = "not at all descriptive," and 7 = "extremely descriptive") We prepared five different versions of the questionnaire, each version included four experiential brands and one nonexperiential brand To examine the consistency of ratings across the five groups, we included Apple, one of the experiential brands, in each version of the questionnaire Each respondent received one of the five versions randomly To reduce primacy and recency effects, in each version, we varied the order of presentation of brands and items

Following Thomson, MacInnis, and Park (2005), we removed the items that more than 10% of participants did not rate, assuming that these items were poorly understood This resulted in the deletion of 4 items We then conducted a factor analysis using Varimax rotation The factor analysis revealed a nine-factor solution with eigenvalues greater than 1 (variance explained = 71%), but only the first four factors were significant based on a scree plot (variance explained = 62%) To interpret the four-factor solution, we examined items that had a loading greater than 4 (88% of items had loadings greater than 4 on at least one factor) The four-factor analysis on the 83 items revealed two factors that were easy to interpret Factor 3 (sensory experience) and Factor 4 (behavioral experience) Factors 1 and 2 included a mix of items Factor 1 focused primarily on intellectual items, and Factor 2 focused on social and affective items

To determine whether the four-factor solution could provide a more distinct structure and to reduce the number of items further, we also conducted an exploratory factor analysis that restricted the number of factors to four (variance explained = 62%) and then used a stricter loading criterion (> 7) to evaluate the Varimax rotated factors Twenty items fulfilled the criterion The results show a distinct pattern Only sensory items loaded on the first factor (6 items), only intellectual items loaded on the second factor (6 items), and only behavioral items (2 items had loadings of greater than 7, and 1 item had a borderline loading of 69) loaded on the third factor Finally, both affective and social items loaded on the fourth factor (5 items), suggesting that the socially worded items include strong emotional aspects In line with Nunnally's (1978) criterion of 7, the Cronbach's alphas were satisfactory They were high for intellectual items (93), sensory items (93), and social/affective items (92), and they were adequate for behavioral items (78)

To check the criterion validity of the new, shorter scale, we calculated the mean value of the 20 items for each of the 21 brands Ratings on the Apple brand were high and consistent (all means ranged from 4 87 to 5 07), indicating that respondents in the five groups used the scale in a similar way Moreover, the data support the criterion validity of the scale Specifically, all the experiential brands had higher mean values than the nonexperiential brands The means of experiential brands ranged from 3 44 to 5 01 3 44 (Reebok), 3 60 (Abercrombie & Fitch), 3 65 (Target), 3 72 (W Hotels), 3 86 (Virgin), 4 00 (Coca-Coca), 4 02 (McDonald's), 4 09 (Barnes & Noble), 4 10 (JetBlue), 4 22 (Starbucks), 4 24 (Sony), 4 32 (Tiffany), 4 63 (Nike), 4 67 (Whole Foods), 4 83 (BMW), and 5 1 (Apple) In contrast, the means of nonexperiential brands were all lower 2 92 (Gristedes), 3 08 (Wal-Mart), 3 20 (IBM), 3 27 (Poland Spring), and 3 33 (Dell) We performed 80 t-tests to examine statistically whether the mean of each experiential brand was significantly different from the mean of each nonexperiential brand A total of 75 comparisons (94% of all comparisons) resulted in significant differences (*ps* < 05) The nonsignificant comparisons included Reebok and Abercrombie & Fitch Specifically, the mean of Reebok was not significantly different from the means of Dell, Poland Spring, and IBM, and the mean of Abercrombie & Fitch was not significantly different from the means of Dell and Poland Spring

Study 3: Further Item Reduction and Confirmation of the Dimensions

In Study 3, we reduced the number of scale items further and conducted both exploratory and confirmatory analyses To test the stability of the scale, we employed a new sample of brands and respondents This enabled us to examine whether responses to the scale items were truly brand and respondent independent and, thus, indicative of a general brand experience

To reduce the number of items further, two independent judges closely examined the 20 items in terms of semantic similarity They omitted 8 items (3 sensory, 3 intellectual, and 2 social items of the social/affective dimension) The new scale resulted in 12 items, including 3 items for each of the four types of experience dimensions (see Table 2, Column 1)

We also prepared a different sample of 30 strong experiential brands (based on expert judgments) We divided them randomly into six groups of 5 brands each (see Table 3, Columns 1 and 2) Next, we asked a new sample of 193 students to evaluate the extent to which the 12 items were descriptive of their experience with each brand using a

TABLE 2
Study 3: Exploratory Factor Analysis: Revealed Brand Experience Dimensions

	Factor		
Item	**Sensory/ Affective**	**Behavioral**	**Intellectual**
This brand makes a strong impression on my visual sense or other senses	**.75**	34	19
I find this brand interesting in a sensory way	**.63**	47	15
This brand does not appeal to my senses [a]	**.59**	35	22
This brand induces feelings and sentiments	**.82**	13	27
I do not have strong emotions for this brand [a]	**.72**	12	38
This brand is an emotional brand	**.75**	13	17
I engage in physical actions and behaviors when I use this brand	18	**.80**	22
This brand results in bodily experiences	33	**.77**	– 03
This brand is not action oriented [a]	13	**.72**	27
I engage in a lot of thinking when I encounter this brand	39	12	**.76**
This brand does not make me think [a]	26	11	**.80**
This brand stimulates my curiosity and problem solving	15	24	**.75**

[a] Items are negatively phrased and reverse coded

Notes Factor analysis uses Varimax rotation Bold values indicate the factor on which each item predominantly loads

TABLE 3
Study 3: Means by Brand for Overall Experience and Experience Dimensions

Brand	Group	Overall Experience	Sensory	Affective	Intellectual	Behavioral
LEGO	3	5 34^{c}	5 34^{b}	5 24	5 60^{c}	5 19^{a}
Victoria's Secret	1	5 28^{b}	5 78^{c}	5 67^{b}	4 18	5 51^{b}
iPod	5	5 15^{b}	5 70^{b}	5 03	4 63^{b}	5 24^{b}
Starbucks	2	4 95^{a}	5 55^{b}	5 27^{a}	4 35^{a}	4 62
Disney	6	4 90	5 72^{c}	5 78^{c}	4 26	3 84
Puma	1	4 72	5 26^{a}	4 63	3 50	5 51^{b}
Viagra	4	4 70	4 70	4 82	3 85	5 35^{b}
Ferrari	6	4 64	5 79^{c}	4 75	3 36	4 67
Toys "R" Us	6	4 64	5 25^{a}	5 16	3 62	4 52
Gatorade	4	4 56	4 85	4 33	3 55	5 52^{b}
Hallmark	1	4 47	4 71	5 47^{b}	4 39^{b}	3 33
Ben & Jerry's	3	4 42	5 13^{a}	4 42	3 56	4 58
Harley-Davidson	4	4 41	4 66	4 38	3 66	4 97
Adidas	5	4 33	4 46	4 02	3 14	5 68^{c}
Nokia	1	4 26	4 63	3 71	4 14	4 56
Hershey's	5	4 17	4 90	4 75	3 22	3 80
Sudoku	6	4 07	4 03	3 31	5 27^{c}	3 65
Blackberry	2	3 92	3 92	3 80	4 00	3 86
Samsung	3	3 86	4 32	3 32	3 87	3 91
L'Oréal	3	3 85	4 40	3 75	3 26	3 88
Gillette	3	3 74	4 14	3 46	2 87	4 49
Tropicana	5	3 63	4 42	3 76	2 95	3 39
Clinique	2	3 62	4 17	3 53	3 18	3 62
American Express	4	3 60	3 67	3 67	3 94	3 12
Prada	2	3 58	3 90	4 26	3 46	2 69
Motorola	5	3 52	3 57	3 20	3 56	3 73
Dannon	1	3 51	4 07	3 76	2 97	3 23
Calvin Klein	6	3 39	4 25	3 75	2 68	2 89
Crate & Barrel	4	3 27	3 55	3 31	3 35	2 91
La Prairie	2	2 97	2 99	3 01	2 80	3 08
Overall		4 18	4 60	4 25	3 71	4 17

^{a}Moderately differentiated
^{b}Highly differentiated
^{c}Unique
Notes all *ps* < 10

seven-point Likert scale (1 = "strongly disagree," and 7 = "strongly agree") The students were paid $5 each to participate

An exploratory factor analysis revealed three factors with eigenvalues greater than 1 The three factors explained 67% of the variance After Varimax rotation, a clean factor structure emerged As Table 2 shows, the 3 sensory and 3 affective items loaded on the first factor, the 3 behavioral items loaded on the second factor, and the 3 intellectual items loaded on the third factor (see Table 3)

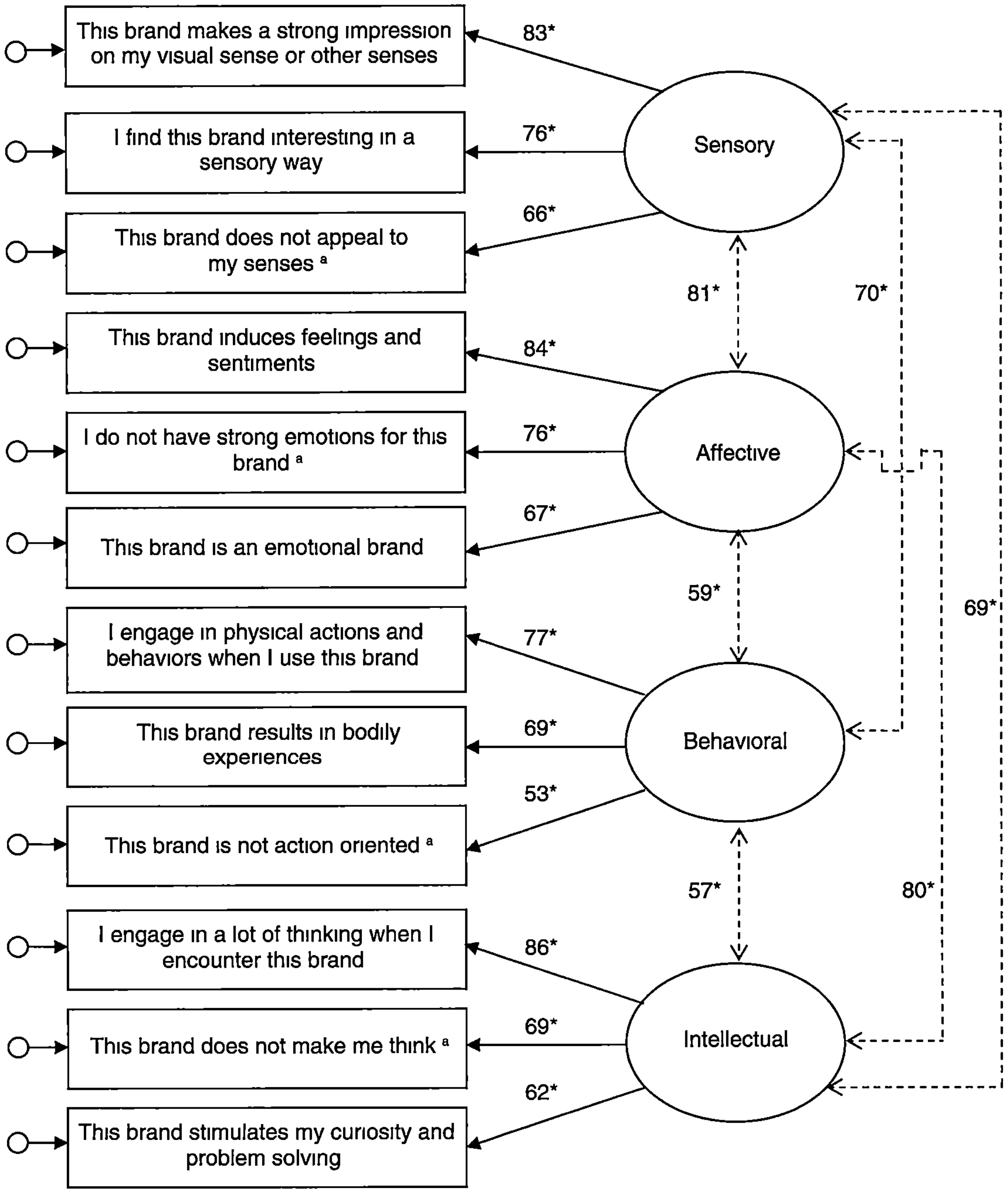
Because we did not anticipate that both sensory and affective items would load on a single factor, we considered the possibility that these 6 items would load first on two first-order factors "nested" within the second-order sensory/affective factor Thus, we conducted another exploratory factor analysis on the 6 sensory and affective items only After Varimax rotation, this subsequent analysis revealed two nested factors—the sensory factor and the affective factor—which explained 74% of the variance We also assessed the internal reliability of the four dimensions of brand experience by calculating a Cronbach's alpha for each dimension using the 12-item scale All values were satisfactory the 3 sensory items = 83, the 3 affective items = 81, the 3 behavioral items = 76, and the 3 intellectual items = 79 In addition, all individual items within each dimension averaged item-to-total correlations of 68, and all exceeded 52, indicating satisfactory levels of internal consistency

On the basis of these results, we investigated the following models further (1) the three-factor model (sensory/affective, behavioral, and intellectual factors), (2) the four-factor model (sensory, affective, behavioral, and intellectual factors), and (3) the nested model (two first-order factors—behavioral items loading on one factor and intellectual items loading on another—plus two other first-order factors, sensory and affective, loading on a second-order factor)

To determine which measurement model fit the data best, we used structural equation modeling to conduct confirmatory factor analyses In addition, we analyzed a model that assumed that all items loaded on a single brand experience construct (i e , one-factor model), a one-factor second-order model with four subdimensions, and a one-factor second-order model with three subdimensions For each model, except for the simple one-factor model, we investigated two cases a case in which factors were allowed to be correlated and a case in which the factors were assumed to be orthogonal Finally, we grouped the observations by brands and centered the means of 12 items at zero to remove any brand effects

The confirmatory factor analyses revealed that the best model was the four-factor model with correlated factors (for details, see Figure 1) The fit measures for that model suggested a reasonable fit The goodness-of-fit index (GFI) = 92, the comparative fit index (CFI) = 91, and the root mean square error of approximation (RMSEA) = 08, all indicating acceptable fit, and $\chi^2(48) = 278\ 61$, $p < 001$ Bagozzi and Heatherton (1994) question the usefulness of the chi-square statistic in similar models, thus, we considered other fit statistics more valuable in this context In addition, the ratio between the chi-square statistic and the number of degrees of freedom was 5 8, close to 5, indicating an adequate fit (lower values are more desirable, Thomson, MacInnis, and Park 2005) The fit measures for this model were better than those for all other tested models, and the chi-square statistic of this model represented a significant improvement over any of the competing models, except for the one-factor second-order model (with four

FIGURE 1
Study 3: Confirmatory Factor Analysis: The Four-Factor Model


This brand makes a strong impression on my visual sense or other senses
I find this brand interesting in a sensory way
This brand does not appeal to my senses a
This brand induces feelings and sentiments
I do not have strong emotions for this brand a
This brand is an emotional brand
I engage in physical actions and behaviors when I use this brand
This brand results in bodily experiences
This brand is not action oriented a
I engage in a lot of thinking when I encounter this brand
This brand does not make me think a
This brand stimulates my curiosity and problem solving
83*
76*
66*
84*
76*
67*
77*
69*
53*
86*
69*
62*
Sensory
Affective
Behavioral
Intellectual
81*
59*
57*
70*
80*
69*

aReverse coded
*$p < 01$
Notes All coefficient values are standardized and appear above the associated path Dotted lines represent correlations

correlated subdimensions), which had the same chi-square statistic of 278.61 (d.f. = 44) (for details, see Table 4) but a higher (i.e., inferior) RMSEA (.09).

Table 3 (Columns 3–7) shows the means of the 30 brands on the overall brand experience scale and its dimensions, ranked by degree of overall experience. Recall that experts preselected all brands to be experiential brands. Thus, any differences among the brands must be interpreted relative to the notion that all are experiential and that some of the perceived differences in the degree of experience may be specific to our sample. To assess whether an experiential brand is viewed as being differentiated from other experiential brands by our respondents in terms of its sensory, affective, intellectual, or behavioral experience, we conducted pairwise comparisons among the 30 brands on each experience dimension. For the comparisons, we treated all data as between subjects (all *ps* < .10). In Table 3, we refer to the group of brands with high means that were significantly different from all other brands (labeled with a superscript "c") as "unique." Excluding these, we refer to the group of brands that had high means and were significantly different from all other brands (labeled with a superscript "b") as "highly differentiated." Finally, excluding these, we refer to brands with high means that were significantly different from all remaining brands (labeled with a superscript "a") as "moderately differentiated."

As Table 3 shows, from the tests and cutoff criteria, on the sensory dimension (Column 4), Ferrari, Victoria's Secret, and Disney are unique, iPod, Starbucks, and LEGO are highly differentiated, and Puma, Toys "R" Us, and Ben & Jerry's are moderately differentiated from the other experiential brands. On the affective dimension (Column 5), Disney is unique, Victoria's Secret and Hallmark are highly differentiated, and Starbucks is moderately differentiated. On the intellectual dimension (Column 6), LEGO and Sudoku are unique, iPod and Hallmark are highly differentiated, and Starbucks is moderately differentiated. Finally, on the behavioral dimension (Column 7), Adidas is unique, Gatorade, Puma, Victoria's Secret, Viagra, and iPod are highly differentiated, and LEGO is moderately differentiated. Overall, respondents rated LEGO, Victoria's Secret, iPod, and Starbucks as the most experiential brands; these brands were unique, highly differentiated, or moderately differentiated on overall experience (see Column 3) and on three of the four experience dimensions (see across columns).

Some of the comparative data among the experiential brands may seem surprising. For example, the iconic Harley-Davidson brand ranks only 13 on the list, behind brands such as LEGO, Victoria's Secret, iPod, and Starbucks, which stand out in terms of their overall experience. In addition, participants rated Toys "R" Us as a more sensory brand than Crate & Barrel. A reason for the relatively low ranking of these brands may be our sample of respondents; that is, students may have less direct experience with Harley-Davidson and Crate & Barrel than with other brands, and they may view these brands as icons of a prior, not their, generation.

To assess the criterion validity of the scale, we asked two experts to categorize each of the 30 brands as either a "highly experiential brand" or a "moderately experiential brand" and, on each dimension, as delivering either a "highly" or a "moderate" sensory, affective, intellectual, or behavioral experience. Interrater agreement was 85%; we included only agreed-on brands (overall and per dimension) in the subsequent analyses. Compared with brands that experts judged as moderately experiential, participants rated highly experiential brands significantly higher on overall experience ($M = 4.81$ versus $M = 3.65$) and on each of the experience dimensions (for sensory, $M = 5.13$ versus $M = 3.89$; for affective, $M = 4.92$ versus 3.64; for intellectual, $M = 3.88$ versus 3.21; and for behavioral, $M = 5.03$ versus 3.60; all *ps* < .01).

Study 4: Additional Reliability and Validity Tests of the Brand Experience Scale

The purpose of Study 4 was to validate the brand experience scale further in several ways. First, to provide evidence of consistency across populations, we conducted Study 4 in a real-life consumer setting with a nonstudent population. Interviewers intercepted 150 consumers (ranging in age

TABLE 4
Study 3: Confirmatory Factor Analysis Model Fit Comparisons

Model	Chi-Square	d.f.	Chi-Square Difference[b]
Null	5079.50	66	—
One factor	1043.50	54	4036, *p* < .001
Three factor	527.90	51	515.60, *p* < .001
One-factor higher order (three subdimensions)	1497.16	48	969.26, *p* < .001
"Nested"[a]	1209.89	48	287.27, *p* < .001
Four factor	278.61	48	931.28, *p* < .001
One-factor higher order (four subdimensions)	278.61	44	0
	GFI	**CFI**	**RMSEA**
One-factor higher order (four subdimensions)	.92	.91	.09
Four factor	.92	.91	.08

[a] For details on this model, see the text.
[b] Chi-square differences represent comparisons of subsequent models (e.g., null versus one-factor model, one-factor model versus three-factor model).

from 15 to 56 years, mean age = 23 years) in the shopping streets of two medium-sized cities and asked them to rate one brand (Nokia) on the 12-item brand experience scale Second, to assess the discriminant validity of the scale from brand attitude, we asked consumers to evaluate the brand on three seven-point scales ("good/bad," "do not like/like very much," and "not attractive/very attractive") Finally, to assess the test–retest reliability of the scale, two weeks after completing the scale for the first time, 72 consumers (mean age = 22 7 years) volunteered to fill out the brand experience scale for a second time for the same brand

The nonstudent sample results were highly similar to the student sample results in the previous study Using confirmatory factor analysis, the best-fitting model was again a four-factor model with correlated factors ($\chi^2(48) = 102\ 85$, $p <\ 00001$, RMSEA = 088) Each item loaded on the predicted factor, with standardized coefficients raging from 77 to 9

Moreover, the brand experience scale displayed high discriminant validity from overall brand evaluations In several exploratory factor analyses, the experience scale and its dimensions were distinct from overall brand evaluations by loading on separate factors Specifically, a factor analysis that did not restrict the number of factors resulted in four factors with eigenvalues greater than 1 (variance explained = 74%) After Varimax rotation, Factor 1 had loadings greater than 68 for the affective and intellectual items, Factor 2 had loadings greater than 79 for the behavioral items, Factor 3 had loadings greater than 78 for the evaluation items, and Factor 4 had loadings greater than 68 for the sensory items All other loadings were less than 4 Another factor analysis (variance explained = 79%) that restricted the number of factors to 5 (thus examining whether the items of the four experience dimensions and the evaluation items would load on different factors) provided a similarly distinct rotated factor pattern that could easily be interpreted as follows Factor 1 was "behavioral experience" (all loadings > 80), Factor 2 was "affective experience" (all loadings > 72), Factor 3 was "sensory experience" (all loadings > 68), Factor 4 was "overall brand evaluation" (all loadings > 78), and Factor 5 was "intellectual experience" (all loadings > 69), all other loadings were less than 37 A final factor analysis that restricted the number of factors to 2 (variance explained = 58%) resulted in an overall experience factor (all brand experience item loadings > 65) and a separate brand evaluation factor (all evaluation item loadings > 78), all other loadings were less than 2

Finally, we examined the test–retest reliability of the brand experience scale by correlating the ratings at the two measurement points, separated by two weeks The test–retest reliability for the overall scale was r = 77, ranging from r = 69 to r = 73 for the dimensions Given the time frame, participants, and environments, the test–retest reliability seems adequate

Study 5: Discriminant Validity of the Brand Experience Scale

We conducted Study 5 to provide additional evidence for the discriminant validity of the scale in relation to brand evaluation and, in particular, key motivational and affective brand constructs Participants (N = 144) completed the 12-item brand experience scale and four seven-point general brand evaluations items ("bad/good," "unfavorable/favorable," "dislikable/likable," and "disagreeable/agreeable") In addition, participants completed items related to the following motivation and affective scales Zaichkowsky's (1985) brand involvement (six items, seven-point scale "unimportant to me/important to me," "of no concern to me/of concern to me," "irrelevant to me/relevant to me," "means nothing to me/means a lot to me," "useless to me/useful to me," and "insignificant to me/significant to me"), Thomson, MacInnis, and Park's (2005) brand attachment (ten items, seven-point scales "affectionate," "loved," "peaceful," "friendly," "attached," "bonded," "connected," "passionate," "delighted," and "captivated"), and Oliver, Rust, and Varki's (1997) customer delight (ten items, five-point scale "astonished," "surprised," "contented," "happy," "cheerful," "pleased," "excited," "enthused," "stimulated," and "elated") To create variation in brand experience scores, we manipulated "experience strength," asking one-third of the respondents each to think about a brand that provides a "strong experience," a "moderate experience," or a "weak, or almost no, experience" for them The manipulation was successful On the composite experience index, participants felt a stronger experience when asked to report on a "strong" brand than when asked to report on a "moderate" or "weak" experiential brand (M = 5 15, M = 3 84, and M = 2 95, respectively, all *ps* < 01)

To prepare the data for further analyses, we reverse-coded negatively worded items and computed composite scores for the four brand experience dimensions (sensory, affective, intellectual, and behavioral), overall brand evaluation, brand involvement, the three brand attachment dimensions (affection, connection, and passion), and customer delight From a factor analysis, we considered customer delight a one-dimensional scale

Next, we conducted a factor analysis on the ten composite brand scales, which revealed a three-factor solution (explaining 75% of the variance) Table 5 shows the factor

TABLE 5
Study 5: Exploratory Factor Analysis (Promax Rotation), Brand Experience Dimensions, and Other Brand Scales

	Factor		
	1	2	3
Sensory experience	07	**.75**	01
Affective experience	21	**.48**	32
Intellectual experience	26	**.82**	– 13
Behavioral experience	– 23	**.58**	54
Overall brand evaluation	19	14	**.81**
Brand involvement	– 05	33	**.68**
Affection	**55**	00	45
Connection	44	– 02	**.58**
Passion	**.73**	23	05
Customer delight	**88**	02	00

Notes Standardized regression coefficients Bold values indicate the factor on which each item predominantly loads pattern after oblique (Promax) rotation. As Table 5 shows, two of the three brand attachment dimensions (affection and passion), as well as customer delight, had their highest loadings on Factor 1; the third brand attachment dimension, connection, also had a considerable loading on this factor. We interpreted the factor as "brand feelings." All four experience dimensions (sensory, affective, intellectual, and behavioral) had the strongest loadings on Factor 2; no other scale loaded strongly on this factor. We interpreted the factor as "brand experience." Finally, brand evaluation, brand involvement, and the brand connection dimension of brand attachment loaded high on Factor 3, which we interpreted tentatively as "brand relationship." Interfactor correlations among the three factors were moderate, ranging from .48 to .54. In summary, brand experience, as measured by the brand experience scale, seems to be distinct, but related, to other constructs, such as brand involvement, brand attachment, customer delight, and brand evaluation.

We also examined a Varimax-rotated three-factor pattern that forces the scales into an orthogonal structure. Again, brand experience emerged as Factor 2, with high loadings, ranging from .58 to .73, for all experience dimensions on the factor; no other scale had substantial loadings, except for a .48 loading of brand involvement. However, as in the oblique solution, involvement had a higher loading again on Factor 3 (.69), together with brand evaluation (.76) and the brand connection dimension of brand attachment (.63).

Finally, we examined a four-factor solution, which explained 81% of the variance. In both the oblique and the orthogonal solutions, we obtained the same factor patterns for the brand feelings and brand relationship factors. However, the brand experience dimensions now loaded on two separate factors. The affective and behavioral dimensions loaded on one factor (.71 and .83, respectively), and the sensory and intellectual dimensions loaded on the other factor (.87 and .61, respectively). These results further attest to the discriminant validity of the brand experience scale from other brand scales.

Conclusion

The 12-item brand experience scale captures in a reliable and stable way four dimensions of brand experience: sensory, affective, behavioral, and intellectual. The scale is short and easy to administer, and it is internally consistent and reliable. Importantly, the brand experience scale is related to, but distinct from, other brand scales. From the results of Studies 3, 4, and 5, the scale as a whole can also be viewed as indicating the overall degree to which a brand evokes experiences, in the sense of a single higher-order factor. In the next study, we examine how brand experience is related to brand personality and whether it can predict behavioral outcomes.

Study 6: Using Brand Experience to Predict Consumer Behavior

In Study 6, we focus on two key behavioral outcomes—customer satisfaction and loyalty (Chandrashekaran et al. 2007; Oliver 1993). On the basis of prior consumer research, we expect that brand experience affects these behavioral outcomes through a direct and indirect route (Chaiken, Liberman, and Eagly 1989; Petty and Cacioppo 1986). If a brand evokes an experience, this alone may lead to satisfaction and loyalty. In addition, an experience may be the basis for more elaborative information processing and inference making that results in brand-related associations (Keller 1993). In turn, these associations may affect satisfaction and loyalty.

One prior study considers how experience affects consumer behavior. Specifically, Chang and Chieng (2006) examine how experiences and brand personality affect brand relationships. However, they do not use various brands but rather focus on coffee retail shops in Shanghai and Taipei, including only one dimension of brand personality—namely, excitement.

Hypotheses Development

In the following section, we first discuss the direct effects of brand experience on consumer behavior and then the indirect effects mediated by brand personality. People seek sensory stimulations (McAllister and Pessemier 1982) and show negative effects under sensory deprivation (Goldberger 1993). They seek pleasure and avoid pain (Freud [1920] 1950), and they need intellectual stimulation to avoid boredom (Cacioppo and Petty 1982). Thus, experiences provide value and utility similar to utilitarian attributes (Brakus, Schmitt, and Zhang 2008). The notion of experiential value is also inherent in the applied work on experience, especially in the work Pine and Gilmore (1999). Because experience provides value, we expect that the more a brand evokes multiple experience dimensions, and therefore has a higher overall score on the scale, the more satisfied a consumer will be with the brand.

Moreover, because experiences result from stimulations and lead to pleasurable outcomes, we expect consumers to want to repeat these experiences. That is, brand experience should affect not only past-directed satisfaction judgments but also future-directed consumer loyalty. Consumers should be more likely to buy a brand again and recommend it to others and less likely to buy an alternative brand (Mittal and Kamakura 2001; Oliver 1997; Reicheld 1996).

H_1: Brand experience affects consumer satisfaction positively.

H_2: Brand experience affects consumer loyalty positively.

In addition to these direct effects, brand experience is also likely to result in further processing and thus affect satisfaction and loyalty indirectly. One construct—and measurement scale—that has been discussed extensively as a key inferential-associative concept is brand personality, which is defined as "the set of human characteristics associated with the brand" (Aaker 1997, p. 347). Both brand experiences and judgments of a brand's personality occur in response to brand contact and include a categorization process; however, the formation and updating of brand personality is a highly inferential process (Johar, Sengupta, and Aaker 2005). According to Aaker (1997), a brand's personality may be inferred from people associated with the brand (e.g., users, company representatives, endorsers), product attributes, category associations, brand name, or communications A useful input in this inference is likely to be brand experience A trait judgment about a brand's sincerity, excitement, competence, sophistication, or ruggedness can be facilitated when the consumer attends to specific sensory, affective, intellectual, or behavioral experiences For example, to conclude that Hallmark is "sincere" (Aaker 1996), a consumer may attend to his or her feelings of happiness, romance, or nostalgia or thoughts of holiday activities Similarly, to conclude that a clothing brand, such as Levi's, is "rugged" (Aaker 1996), a consumer may attend to his or her sensory experiences based on the brand's colors, thoughts about the "Wild West" origin of the brand, or bodily experiences based on the fit and texture of the jeans Thus, experiences are used as information (Pham 2004) This information, in conjunction with other information, may be combined into a brand personality judgment

As a result, we expect that brand experience is an antecedent of brand personality The higher the overall score on the brand experience scale, the more likely the consumer will endow the brand with personality associations The reverse process—brand personality preceding brand experience—is conceptually less plausible, it is not clear how sensory, affective, intellectual, or behavioral experiences could easily result from a summary judgment such as brand personality

H_3 Brand experience affects brand personality positively

Brand personality provides differentiation, increases preference, and enhances trust and loyalty (Biel 1993, Fournier 1998) Moreover, selecting a brand with a certain personality enables consumers to express themselves (Aaker 1999) Thus, brand personality offers value to consumers similar to experiences Therefore, the more a brand is associated with human characteristics, the more satisfied and loyal a consumer will be

H_4 Brand personality affects consumer satisfaction positively
H_5 Brand personality affects consumer loyalty positively

Finally, it has been shown that consumer satisfaction affects loyalty When a consumer feels good about the relationship and appreciates the product or brand, a high level of commitment and loyalty results (Anderson and Sullivan 1993, Mittal and Kamakura 2001, Oliver 1997) Thus

H_6 Consumer satisfaction affects consumer loyalty positively

Procedure

A total of 209 students participated in Study 6 for a compensation of $5 Each participant rated the extent to which the items described his or her experiences with the brands listed, the personality of the brands listed, and feelings of satisfaction and loyalty toward the brands

The brand experience scale included the 12-item scale we used in Studies 3, 4, and 5 To measure brand personality, we included a version of the scale that consisted of the 15 brand personality items that represented the five brand personality dimensions "down-to-earth," "honest," "wholesome," and "cheerful" (for sincerity), "daring," "spirited," "imaginative," and "up-to-date" (for excitement), "reliable," "intelligent," and "successful" (for competence), "upper-class" and "charming" (for sophistication), and "outdoorsy" and "tough" (for ruggedness) (Aaker 1997, p 352) We measured items on a seven-point Likert scale (1 = "not at all descriptive," and 7 = "extremely descriptive") and provided the instructions in line with the work of Aaker (1997)

We measured consumer satisfaction using five items modeled after Oliver (1980) "I am satisfied with the brand and its performance," and "If I could do it again, I would buy a brand different from that brand" (negative item, reverse coded), "My choice to get this brand has been a wise one," and "I feel bad about my decision to get this brand" (negative item, reverse coded), and "I am not happy with what I did with this brand" (negative item, reverse coded) Each seven-point Likert scale was anchored by "strongly disagree" (1) and "strongly agree" (7)

Finally, to measure consumer loyalty, we adopted five standard loyalty items from the work of You and Donthu (2001) "In the future, I will be loyal to this brand", "I will buy this brand again", "This brand will be my first choice in the future", "I will not buy other brands if this brand is available at the store", and "I will recommend this brand to others" Again, we measured the items on a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7)

Participants rated a set of 12 brands for six categories Apple and Dell (computers), Fiji and Poland Spring (water), J Crew and Liz Clairborne (clothing), Puma and New Balance (sneakers), Volkswagen and Saturn (cars), and the *New York Times* and *USA Today* (newspapers) Each participant evaluated two categories and both brands within that category We counterbalanced the order of presentation of the category and the order of brands within each category

Results and Discussion

Before estimating the structural equation model based on our conceptual model, we examined the discriminant validity of the brand experience scale from the brand personality scale Given the large sample size, we were able to conduct an exploratory factor on the entire set of original items—the 12 items of the brand experience scale and the 15 items of the short version of the brand personality scale that address the five dimensions of brand personality (sincerity, excitement, competence, sophistication, and ruggedness) The exploratory factor analysis revealed five factors with eigenvalues greater than 1, but the scree plot exhibited a significant dip between the fourth and the fifth factor The first four factors explained 62% of the variance After Varimax rotation, a clean factor structure emerged (see Table 6) In general, brand experience and brand personality exhibited high levels of discriminant validity The respective items loaded on separate factors Factor 3 was the only factor that included both personality and brand experience items, namely, behavioral experience and ruggedness items

We also conducted a factor analysis on the composite scores of each brand experience and brand personality dimension, which further confirmed the discriminant validity of the scales Two factors had eigenvalues greater than 1 After Varimax rotation, the experience dimensions and the personality dimensions loaded separately on the two factors, however, on the three-factor solution, the behav-

TABLE 6
Study 6: Exploratory Factor Analysis (Varimax Rotation) with Brand Personality Dimensions and Brand Experience Dimensions

	Factor			
	1	2	3	4
Sensory 1	36	**.67**	25	17
Sensory 2	25	**.60**	41	15
Sensory 3	22	**.62**	13	07
Affective 1	23	**.71**	20	15
Affective 2	08	**.73**	12	05
Affective 3	15	**.58**	32	08
Behavioral 1	03	28	**.73**	09
Behavioral 2	– 01	22	**.78**	11
Behavioral 3	11	27	**.47**	– 03
Intellectual 1	25	**.78**	08	08
Intellectual 2	15	**.74**	– 13	– 09
Intellectual 3	27	**.72**	11	05
Sincerity 1	03	07	14	**.86**
Sincerity 2	34	17	06	**.79**
Sincerity 3	16	04	16	**.86**
Sincerity 4	45	08	33	**.50**
Excitment 1	**.69**	25	41	– 06
Excitment 2	**.68**	25	40	09
Excitment 3	**63**	29	29	07
Excitment 4	**.80**	26	05	05
Competence 1	**63**	15	06	42
Competence 2	**77**	31	– 05	27
Competence 3	**77**	24	– 05	22
Sophistication 1	**.69**	19	07	08
Sophistication 2	**.57**	21	36	26
Ruggedness 1	15	– 12	**.66**	32
Ruggedness 2	33	06	**.55**	10

Notes Bold values indicate the factor on which each item predominantly loads

ioral experience dimension and ruggedness formed their own factor

Figure 2 shows the estimated structural equation model To estimate the proposed model given the number of observations, we used composite measures of the four brand experience and the five brand personality dimensions to reduce the number of parameters Internal consistencies of the composite measures were satisfactory (Cronbach's alphas the sensory dimension = 77, the affective dimension = 74, the intellectual dimension = 79, the behavioral dimension = 72, sincerity = 85, excitement = 88, competence = 86, sophistication = 72, and ruggedness = 71)

The estimated model fits the data reasonably well GFI = 86, CFI = 91, and RMSEA = 08, with $\chi^2(146)$ = 793 9, $p <$ 001 (ratio between chi-square and the number of degrees of freedom = 5 4) All path coefficients in the model are significant (ps < 05) As we predicted, experience affects satisfaction and loyalty both directly and indirectly through brand personality The direct and indirect effects of brand experience on loyalty are roughly equal The total direct effect on loyalty (through satisfaction) is 33 (24 + 15 × 59), and the total indirect effect is 36 (69 × 67 × 59 + 69 × 13), resulting in a total effect of 69 The total effect of brand personality on loyalty is 53 (13 + 67 × 59), which is higher than the total direct effect of experience on loyalty Notably, there are differential effects of brand experience and brand personality on satisfaction and loyalty The direct effect of experience on loyalty (24) is higher than the direct effect of experience on satisfaction (15), however, the direct effect of brand personality on loyalty (13) is lower than the direct effect of brand personality on satisfaction (67) Thus, brand experience seems to be a stronger predictor of actual buying behavior than brand personality, which in turn is a better predictor of satisfaction This result may be related to the very nature of experience If a brand stimulates the senses, makes the person feel good, and engages the mind and body, a stimulation-seeking organism may strive to receive such stimulation again In contrast, the private nature of experiences may make them less malleable and less subject to situational influences than the more social and self-expressive brand personalities (Aaker 1999)

In addition to the proposed model, we tested an alternative model that considered that brand experience and personality may affect consumer behavior independently Therefore, in this model, we did not include the path that links brand experience to brand personality The alternative model had a worse fit GFI = 84, CFI = 88, and RMSEA = 096, with $\chi^2(146)$ = 1186 The difference in chi-square values between the two models was 392 1 ($p <$ 001)

General Discussion

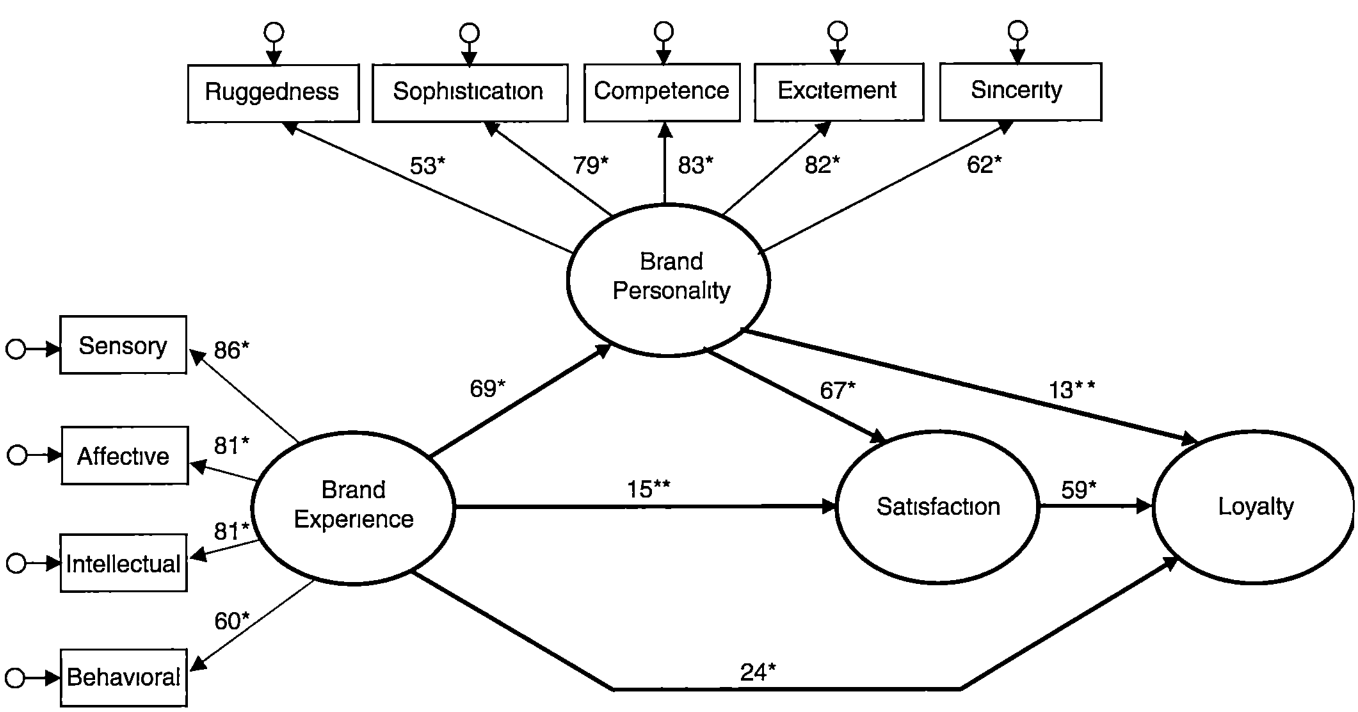
Brand experiences arise in a variety of settings when consumers search for, shop for, and consume brands Accordingly, we conceptualized brand experience as subjective consumer responses that are evoked by specific brand-related experiential attributes in such settings We demonstrated that brand experience can be broken down into four dimensions (sensory, affective, intellectual, and behavioral), which are differentially evoked by various brands

The brand experience scale that we constructed is short and easy to administer, consisting of only 12 items Psychometrically, the scale is internally consistent and consistent across samples and studies The scale also successfully passed various reliability and validity tests, including test–retest reliability and criterion validity Most important, the brand experience scale displays discriminant validity from some of the most widely used branding measures and scales, including brand evaluations, brand involvement, brand attachment, customer delight, and brand personality Finally, brand experience has a behavioral impact, it affects consumer satisfaction and loyalty directly and indirectly through brand personality

The scale will be useful not only in academic research but also in marketing practice As marketers engage in projects to understand and improve the experience their brands provide for their customers, they can use the scale for assessment, planning, and tracking purposes

We encourage further research on the brand experience scale The scale currently does not measure whether an experience is positive or negative As we have conceptualized and shown empirically, having experiences in and of themselves seems to have value and results in positive outcomes However, further research should explore positively

FIGURE 2
Study 6: Discriminant and Predictive Validity of the Brand Experience Scale



*p< 01
**p< 05
Notes All coefficient values are standardized and appear near the associated path

worded and negatively worded versions of the scale and investigate how positive and negative experiences affect consumer behavior There seems to be two ways to create valenced versions of the scale One way is to reword the scale items slightly by including the words "positive" or "negative"—for example, "This brand makes a strong positive/negative impression on my visual sense or other senses," "This brand induces positive/negative feelings and sentiments," "This brand results in positive/negative bodily experiences," or "I engage in a lot of positive/negative thinking when I encounter this brand" The second way is to add a phrase and a bipolar response scale after each scale item—for example, " and this results in an experience that is 'very positive' (1) or 'very negative'(7)" Further research should determine which method is more reliable and valid

Further research should also examine whether the scale can predict specific behavioral outcomes On the basis of our theorizing, we would expect the sensory dimension to predict future design and aesthetics perceptions and usages, the affective experience to predict emotional judgments, the intellectual dimension to predict creative usages of the brand, and the behavioral experience to predict specific actions and physiological reactions when interacting with a brand

In addition to research on the scale, we encourage research on the experience concept For example, many experiences, especially in the services industry (e g , restaurants, spas, airline flights), extend over time Research has shown that the pattern of extended experiences (e g , increasing or decreasing in intensity) can affect how experiences are evaluated (Ariely 1998, Ariely and Zauberman 2003) Such research has used the term "experience" generically to refer to responses within a certain time frame From the studies reported here, it would be worthwhile to explore which patterns occur for which experience dimensions Moreover, we assessed experiences retrospectively, we did not directly assess a consumer's dynamic experience with a brand Further research should investigate whether retrospective experiences are different from dynamic experiences, in terms of both structure (i e , the type of dimensions that are most commonly involved) and content (i e , the specific sensations, feelings, cognitions, and behaviors that are involved)

Finally, further research should focus on the antecedents and long-term consequences of brand experiences For example, regarding antecedents, how exactly are brand experience dimensions evoked by brand-related stimuli? In addition, although we have shown the impact of brand experience, both directly and indirectly, on short-term consequences, such as satisfaction and loyalty, the question arises whether brand experiences affect customer lifetime value (Rust, Zeithaml, and Lemon 2000, Vogel, Evanschitzky, and Ramaseshan 2008) That is, can brand experiences build customer equity, and how should marketers manage brands to create experiences that build such equity?

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Does Customer Demotion Jeopardize Loyalty?

Hierarchical loyalty programs award elevated customer status (e.g., "elite membership") to consumers who meet a predefined spending level. However, if a customer subsequently falls short of the required spending level, firms commonly revoke that status. The authors investigate the impact of such customer demotion on loyalty intentions toward the firm. Building on prospect theory and emotions theory, the authors hypothesize that changes in customer status have an asymmetric negative effect, such that the negative impact of customer demotion is stronger than the positive impact of status increases. An experimental scenario study provides evidence that loyalty intentions are indeed lower for demoted customers than for those who have never been awarded a preferred status, meaning that hierarchical loyalty programs can drive otherwise loyal customers away from a firm. A field study using proprietary sales data from a different industry context demonstrates the robustness of the negative impact of customer demotion. The authors test the extent to which design variables of hierarchical loyalty programs may attenuate the negative consequences of status demotions with a second experimental scenario study and present an analytical model that links status demotion to customer equity to aid managerial decision making.

Keywords: loyalty programs, customer demotion, customer loyalty, prospect theory, relationship marketing

Companies in the United States spend more than $1.2 billion on customer loyalty programs per year, and the average household belongs to 12 of such programs (Ferguson and Hlavinka 2007; Kumar 2008). Hierarchical loyalty programs award preferred customer status (e.g., "elite membership"), providing exclusive benefits to consumers who have exceeded a certain spending level. Such programs are common in many service industries, including airlines (e.g., Continental), banking (e.g., UBS), department store retailing (e.g., Neiman Marcus), and hotels (e.g., Marriott).

To maintain preferred customer status, elevated consumers usually must maintain high levels of spending with the company (Kumar and Shah 2004), but what happens when a customer falls short of the company's expectations and therefore loses his or her preferred status? That is, what happens when the customer is "demoted" by the company? Service firms that run hierarchical loyalty programs demote thousands of customers every day (Reed 2005), but the full ramifications of such systematic customer status reductions remain unclear. Whereas disciplines such as sociology (Garfinkel 1956) and organizational psychology (Gephart 1978) have long recognized status demotion as an important research issue, no existing marketing research has considered the effects of status reductions of consumers. This lack of research has particular importance because arguments from prospect theory and emotions theory suggest that customer demotion has the potential to destroy healthy customer relationships. Specifically, we theorize that customer demotion reduces loyalty intentions toward a firm to a level that is lower than the level of loyalty intentions the customer held before being elevated to preferred status. We present the psychological mechanisms through which this destructive effect takes place and test them through an experimental investigation using the scenario method and a field study based on proprietary company data from a different industry context. We test whether certain loyalty program design variables limit the destructive effect caused by customer demotion with a second scenario experiment and analytically link our findings to the strategic variable of customer equity.

Status Demotion Research

Status, or the position or rank in a certain group awarded to a person by others (Packard 1959), is a strong motivator of human behavior (Frank 1985). Elevated levels of status correspond to a set of exclusive rights and benefits, which often provoke respect, consideration, or envy from others (Csikszentmihalyi and Rochberg-Halton 1981). The phenomenon of status demotion initially emerged as a relevant research topic among sociologists and anthropologists and was first recognized by Garfinkel (1956), who coined the term "status degradation ceremony" to refer to the commu-

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nication of a status reduction to the affected person (Finkelstein 1996, Young 1965) Some 20 years later, Gephart (1978) became the first organizational behavior scholar to address the topic Employing an ethnomethodological approach, he investigated the demotion process in relation to organizational succession Since then, other scholars have studied status reductions in organizations and have found that demotion constitutes a critical incident, followed by the experience of negative affect and "withdrawal behaviors" (e g , decreasing loyalty to the organization) by the demoted consumers (e g , Pfeffer 1981, Trice and Beyer 1984) Although the impact of preferential customer treatments on loyalty has emerged as an urgent research topic in the marketing discipline (e g , Dreze and Nunes 2007, Wangenheim and Bayon 2007), we are not aware of a single study that examines the demotion of customers and their reactions to it

How Customer Demotion Affects Loyalty Intentions

In hierarchical loyalty programs, introducing preferential customer treatment provides additional benefits to customers, which should increase their loyalty intentions toward the firm (Lacey, Suh, and Morgan 2007) Intuitively, withdrawing preferred customer status and the benefits associated with it then should cause the customer to return to his or her original level of loyalty intentions However, arguments from both prospect and emotions theory suggest that such withdrawal can cause negative effects, which in turn can drive an otherwise loyal customer away from the firm

A Prospect Theoretical Perspective on Customer Demotion

Prospect theory helps explain asymmetries in people's evaluations and behaviors relative to their perceived losses or gains in conditions of perceived uncertainty (Kahneman and Tversky 1979) It builds on the principle that human perception tends to be related to changes in or differences among certain conditions instead of their absolute magnitude, it also assumes that people regard given outcomes either as losses or as gains relative to a certain reference point (Qualls and Puto 1989) A key element of prospect theory entails the loss aversion bias, which states that people tend to be more sensitive to changes they perceive as losses than to equally strong changes they interpret as gains (Ho, Lim, and Camerer 2006, Thaler 1980) According to a prospect theoretical perspective, an increase in customer status constitutes a gain for the awarded customer because the customer receives certain benefits to which he or she had no access before the status elevation Such benefits include convenience (e g , personal assistance by courteous service personnel instead of automated service kiosks or telephone help lines) and recognition (e g , giving customers "the ability to feel special", Shugan 2005, p 190) However, the withdrawal of a customer's preferred status because of a reduced spending level represents a loss for the customer relative to his or her reference point, that is, the previously held status (Knetsch 1989) After such a demotion, the customer can no longer access the additional benefits that correspond to elevated status Prospect theory's loss aversion bias suggests that status demotion (i e , the loss of customer status and its exclusive benefits) should be more influential for human judgments and future behavior—namely, customer loyalty intentions—than equally strong gains (i e , the initial increase in customer status and the associated benefits) (Ho, Lim, and Camerer 2006) Accordingly, we expect that status demotion exerts an asymmetric negative effect on customer loyalty intentions, such that the negative effect of status decreases on loyalty intentions demonstrates a stronger magnitude than the positive effect of status increases In other words, members of loyalty programs who lose their previously elevated customer status and return to the customer status they had before their elevation will demonstrate lower loyalty intentions than not only members who maintain their elevated customer status (i e , experienced a gain but no loss) but also members whose status never increased in the first place (i e , experienced neither a gain nor a loss)

An Emotion Theoretical Perspective on Customer Demotion

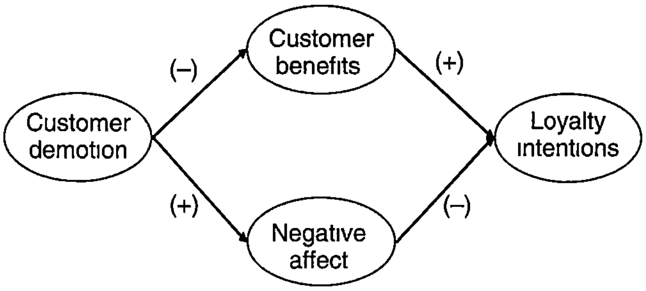
As a cognitive theory originating in behavioral economics, prospect theory elides the potential effect of emotional reactions to status changes However, a status demotion also conveys to the customer that he or she has not performed to meet the company's expectations and is no longer part of the company's "inner circle" (Trice and Beyer 1984) Such an unpleasant experience is likely to elicit the experience of negative emotional states, such as anger and disappointment (Fournier, Dobscha, and Mick 1998, Lazarus 1991) This argument is in line with demotion research in organizational psychology and sociology, which indicates that status reductions commonly cause negative emotions within the person who loses status (e g , Smith 2002) Building on extensive research that demonstrates the destructive effects of negative emotions on customer attitudes and behaviors (e g , Bougie, Pieters, and Zeelenberg 2003), we propose that the negative emotions triggered by demotion will translate into reduced customer loyalty intentions, strengthening the negative effect caused by the withdrawal of benefits captured by the loss aversion bias

In summary, arguments from prospect and emotions theory lead to us expect that customer demotion will have an asymmetric negative impact on customer loyalty intentions Furthermore, we argue that customers' greater sensitivity to a loss of benefits than to a gain of the same benefits, combined with the negative affect caused by the demotion act, represents the psychological mechanism through which demotion reduces loyalty intentions We illustrate this rationale in Figure 1 and summarize it in our first two hypotheses

H_1 Customer demotion exerts a negative asymmetric effect on customer loyalty intentions, decreases in loyalty intentions caused by status reductions have a greater magnitude than increases caused by status elevations

H_2 Customer demotion decreases customer loyalty intentions through (a) decreased perceptions of experienced benefits and (b) increased levels of negative affect

FIGURE 1
Structural Model of the Psychological Mechanisms Between Demotion and Loyalty Intentions



Study 1: Testing the Effect of Customer Demotion on Loyalty Intentions with a Laboratory Experiment

Methodology

Context and dramaturgy We test the proposed effects of customer demotion in the context of airlines' frequent-flier programs (see Dreze and Nunes 2004) This industry context is appropriate because differentiation in customer status is a widespread marketing practice among airlines We conduct an experimental scenario study with three different service scenarios, corresponding to a nested between-groups design in which the scenarios vary on two factors status elevation and status demotion A status reduction implies that the customer has been awarded elevated status previously, so status demotion represents a nested factor within the elevated condition Consequently, the three experimental groups are as follows (1) a stable-status group (no elevation, no demotion), (2) an elevated-status group (elevation, no demotion), and (3) a demoted-status group (elevation, demotion)

Scenario methods, which ask participants of experiments to imagine themselves in hypothetical constellations and roles, are designed to provide insight into social psychological responses to hypothetical situations and have proved ideal for such constellations (Kwon and Weingart 2004) In this specific case, each of our three scenarios asks participants to envision themselves as long-term customers of the fictitious airline Premier Air We assigned respondents randomly to one of the three customer status scenarios, in line with Dreze and Nunes's (2007) recommendation To provide realistic experimental manipulations, we reviewed existing hierarchical loyalty programs to determine the benefits they offer customers with elevated status We found that convenience and recognition benefits are among the most widely used in the airline industry, and therefore we focus on these benefits We also studied the formal conditions of elevated customer membership in the airline industry and designed our manipulations accordingly At the beginning of the experiment, participants in all three experimental groups reviewed background information about Premier Air and their relationship with the airline We required all participants to be active members of at least one frequent-flier program in real life We offered no further information to the stable-status group but presented the elevation manipulation to the elevated- and demoted-status groups Finally, for the demoted group only, we provided the demotion manipulation We report all manipulations in Appendix A

Measures After presenting the background information and manipulations, we asked participants to rate their perceptions of the convenience and recognition benefits offered by Premier Air, their experience of negative affect, and their loyalty intentions (Agustin and Singh 2005) We adopt reflective multi-item measures for all latent variables from the extant literature and slightly modify them to fit the purpose of the current research, all items appear in Appendix B Furthermore, the questionnaire includes manipulation and realism check items

Sample We applied a data collection procedure similar to that which Tokman, Davis, and Lemon (2007) use Specifically, students in undergraduate marketing classes at a major public university in the southwestern United States solicited participants according to a provided list of criteria and directed them to a Web site that contained the scenario descriptions and questionnaire The quota character is an accepted characteristic for experimental research (Hennig-Thurau et al 2006) Students received extra credit for their contribution Participants were incentivized by being entered into a free drawing to win one of ten $30 gift certificates for the online retailer Amazon com Each participant in the experiment agreed to be called if they won the drawing or for personal validation Contacting the winners of the drawing and a set of random participants indicated no problematic responses Our final sample included 359 participants, their average age was 45 years, 53% were women, and 49% had experienced college education

Manipulation and Realism Checks

We record the effectiveness of our manipulation of status elevation with two items ("At one point, I was elevated to a higher customer status," and "At one point, I was given a preferred customer status by Premier Air") measured on seven-point scales ranging from "absolutely false" (1) to "absolutely true" (7) ($\alpha = 88$) An analysis of variance (ANOVA) of the composite score supports the effectiveness of the status elevation manipulation ($M_{elevation} = 5\ 96$, $M_{no\ elevation} = 4\ 59$, $F(1, 357) = 59\ 03$, $p < 001$) [1] Likewise, we test our status demotion manipulation using three items "My status as a customer was degraded," "My status as a customer was demoted," and "My status as a customer was reduced" ($\alpha = 92$) Again, the manipulation is successful ($M_{demotion} = 5\ 02$, $M_{no\ demotion} = 2\ 35$, $F(1, 357) = 218\ 73$, $p < 001$) We find no significant effect of the status demotion manipulation on the respondents' elevation perceptions ($M_{demotion} = 6\ 09$, $M_{no\ demotion} = 5\ 75$, $F(1, 245) = 3\ 58$, not significant) and thus rule out confounding effects

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[1] An explanation for the relatively high mean value in the nonelevated condition is that, to some extent, respondents may consider participation in the loyalty program per se one form of a status advantage (compared with nonmembers of the program)

To investigate the realism of our experimental design, we also include two "realism check" items (Darley and Lim 1993) in the questionnaire, using the same scales ("I could imagine an actual airline doing the things described in the situation earlier," and "I believe that the described situation could happen in real life," α = 90) The responses to these items reflect a sufficient level of realism of the employed manipulations ($M_{\text{composite score}}$ = 5 43, SD = 1 51) [2]

Validity Assessment

We conduct a confirmatory factor analysis using LISREL 8 71 to assess the measurement properties of our scales for convenience benefits, recognition benefits, negative affect, and loyalty intentions The results indicate a good overall fit of the model ($\chi^2(95)$ = 173 42, $p <$ 001, root mean square error of approximation = 04, nonnormed fit index = 99, and comparative fit index = 99), as well as solid psychometric properties of the measures Specifically, all standardized factor loadings exhibit statistical significance at $p <$ 001, which indicates convergent validity Factor magnitudes range from 69 to 97 and demonstrate positive signs Evidence of internal consistency stems from composite reliability (values ranging from 90 to 97), alpha scores (90 to 97), and average variance extracted (AVE, 69 to 89) We also achieve discriminant validity according to Fornell and Larcker's (1981) suggested criterion because the AVE is greater than the squared correlation for each pair of factors We provide the descriptive information and bivariate correlations in Table 1

Results

To assess the proposed overall asymmetric effect of customer demotion on loyalty intentions, we compare the three groups, which differ in terms of initial and final elevated status (i e , stable, elevated, and demoted status), akin to the procedures that Strahilevitz and Loewenstein (1998) demonstrate We employ a set of corresponding ANOVAs to compare the size of the effects caused by status elevations and reductions to provide evidence for the asymmetric nature of the overall effect (e g , Sen and Bhattacharya 2001) In a first step, an integrative analysis with all three groups reveals that the differences in the loyalty intentions means are highly significant (F(2, 356) = 43 80, $p <$ 001) More specifically, although status elevations exert a positive impact on loyalty intentions (M_{SS} = 5 38, M_{ES} = 5 84, F(1, 212) = 5 55, $p <$ 05), the negative impact of demotions appears to be much more pronounced (M_{ES} = 5 84, M_{DS} = 4 09, F(1, 245) = 77 57, $p <$ 001), demonstrating asymmetric characteristics Moreover, the findings suggest that demoted customers' loyalty intentions are significantly lower than those of customers whose status never increased in the first place (M_{SS} = 5 38, F(1, 257) = 39 33, $p <$ 001) These results fully support H_1 and suggest that though elevated customer status increases customers' loyalty intentions as companies hope, demoted customers exhibit substantially lower loyalty intentions than customers who have never experienced a status increase

In the next step, we investigate the psychological mechanisms through which status demotions may reduce customer loyalty intentions Following the advice of Bagozzi and Yi (1994), we apply the distribution-free approach of partial least squares (PLS) structural equation modeling to analyze our experimental data [3] We use SmartPLS 2 3 to conduct the analysis We create two subsamples to provide evidence of the proposed relationships from different conceptual angles The first subsample comprises demoted- versus elevated-status respondents (but excludes members of the stable-status group), whereas the second subsample contains demoted-status and stable-status (but not elevated-status) respondents To determine the statistical significance of the parameter estimates, we generate t-values with a nonparametric bootstrapping procedure We generate 500 resamples, all of which are the size of the original observations (Efron 2000) Table 2 summarizes the estimation results for both subsample comparisons

Comparing demoted- and elevated-status customers, we find that status demotion exerts a strong negative effect on both convenience benefits (γ = – 52, t = –11 47) and recognition benefits (γ = – 37, t = –6 75) In other words, customers' benefit perceptions are lower after a demotion Similarly, status demotion strongly increases customers' experience of negative affect (γ = 57, t = 12 64) Regarding the impact of benefits and emotions on loyalty intentions, we find that convenience benefits (β = 23, t = 3 63) and negative affect (β = – 53, t = –9 68) influence loyalty intentions, whereas the path coefficient from recognition benefits to loyalty intentions is positive but insignificant ($p <$ 05) To determine whether the benefits and negative affect fully mediate demotion's impact on customer loyalty intentions or whether other phenomena also influence it, we estimate a rival model with an additional direct path from customer demotion to loyalty intentions (Iacobucci, Saldanha, and

TABLE 1
Study 1: Correlation Matrix (n = 359)

	M (SD)	DEM	CB	RC	AFF	LOY
Customer demotion (DEM)	N A	1				
Convenience benefits (CB)	4 81 (1 82)	– 43	1			
Recognition benefits (RC)	3 12 (1 64)	– 31	53	1		
Negative affect (AFF)	2 83 (2 07)	54	– 38	– 24	1	
Loyalty intentions (LOY)	4 99 (1 72)	– 43	50	36	– 61	1

Notes All correlations are significant at $p <$ 01 (two-tailed) N A = not applicable

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[2] A postexperimental inquiry yielding 82 additional qualitative responses regarding participants' perceived purpose of the experiment indicates that demand artifacts are of no relevant concern for this research Detailed information on this inquiry is available on request

[3] All structural models, including rival models, were also estimated with covariance-based structural equation modeling using LISREL 8 71 Both methods, PLS and LISREL, lead to identical findings in terms of the (in)significance of parameter estimates and their signs Neither method provides higher or lower estimates or t-values than the other one

TABLE 2
Study 1: Path Coefficients from PLS Analysis

Effects on Cognitive and Affective Consequences

		Estimate		t-Value		R^2	
Dependent Variable	Structural Path	Demoted Versus Elevated Subsample	Demoted Versus Stable Subsample	Demoted Versus Elevated Subsample	Demoted Versus Stable Subsample	Demoted Versus Elevated Subsample	Demoted Versus Stable Subsample
Convenience benefits	Demotion → convenience benefits	– 52**	– 32**	–11 47	–5 78	27	10
Recognition benefits	Demotion → recognition benefits	– 37**	– 29**	–6 75	–4 80	13	09
Negative affect	Demotion → negative affect	57**	49**	12 64	9 88	33	24
Effects of Loyalty Intentions							
Loyalty intentions	Convenience benefits → loyalty intentions	23**	21**	3 63	3 16	52	40
	Recognition benefits → loyalty intentions	08	13*	1 58	2 15		
	Negative affect → loyalty intentions	– 53**	– 48**	–9 68	–8 81		

*$p <$ 05 (two-tailed)
**$p <$ 01 (two-tailed)

Deng 2007) The added path is insignificant (t = 95), providing evidence for full mediation and support for H_2

The results remain similar when we compare demoted- and stable-status customers All the path coefficients point in the same directions, and all significant paths from the first analysis are also significant here The only difference is that the relationship between recognition benefits and loyalty intentions is indeed significant in this analysis (β = 13, t = 2 15) A key insight of the second model test is that customers who lose their preferred customer status perceive significantly fewer benefits from a service provider and report significantly more negative feelings toward the service provider than otherwise identical customers who have never been elevated Again, we estimate a rival model, and the results suggest that the added relationship between demotion and loyalty intentions is insignificant (t = 54) and, therefore, fully mediated by the proposed psychological mechanisms

Study 2: Investigating Demoted Customer Behavior in a Field Setting

We conducted Study 1 in a laboratory context In Study 2, we analyze customers' behavioral reactions to status demotion using proprietary purchase data from a different industry context

Company Background

We gained access to proprietary sales activity data from a major retail company that operates department stores across Europe Department store retailing has been demonstrated to be an effective context for this type of research (e g , Lacey, Suh, and Morgan 2007) The company maintains a hierarchical loyalty program that distinguishes between a standard customer card, which any customer can apply for and which offers minor advantages, such as flexible payment plans, and a "gold card," which assigns customers an elevated status with several additional recognition and convenience benefits (e g , VIP events and access, preferred parking) The company automatically upgrades customers to gold status when they spend $7,500 or more within two consecutive years, the upgrading takes place throughout the year after the required spending level has been reached[4] In 2006, approximately 1 5% of the company's customer cards were gold cards The company systematically demotes gold card owners when they no longer meet the required revenues, sending a letter that states that because the customer's revenues did not meet the revenue required for gold status over the past two years, he or she has been demoted and that the gold card is no longer valid, a procedure similar to our experimental manipulations The demotion act is conducted annually by the end of February

Study Population

We obtained two sets of purchase data from the company The first data set includes all transactions between January 2004 and July 2007 from the 1423 customers whose status was reduced in 2006 (individual-level data before 2004 are deleted by the company and therefore were not available) Note that our key variable for this analysis is purchase behavior of relationship customers over a limited period, which is conceptually different from loyalty intentions, which tend to have a "stronger theoretical meaning" (Kumar and Reinartz 2006, p 98) However, we expect similar results for both constructs To include data for four years (two years before demotion and two years after demotion), we consider transactions that took place only until July of the respective year A time frame of four years of such proprietary company data of customers' purchase behaviors parallels similar research efforts (e g , Wangenheim and Bayon 2007) Because of the strong seasonal variation in retail revenues, comparing revenues (or transactions) between different months or periods does not seem appropriate Overall, this data set contains approximately 150,000 individual transactions, corresponding to revenues of approximately $4 4 million All data are adjusted for inflation The second data set contains all transactions from the 1810 customers whose status was upgraded to gold during 2006, which enables us to compare the revenues after the demotion with customers' reaction to a status increase With regard to the status increase effect on purchase behavior, we compare a period of equal length before the status increase with purchase patterns a year after the status increase

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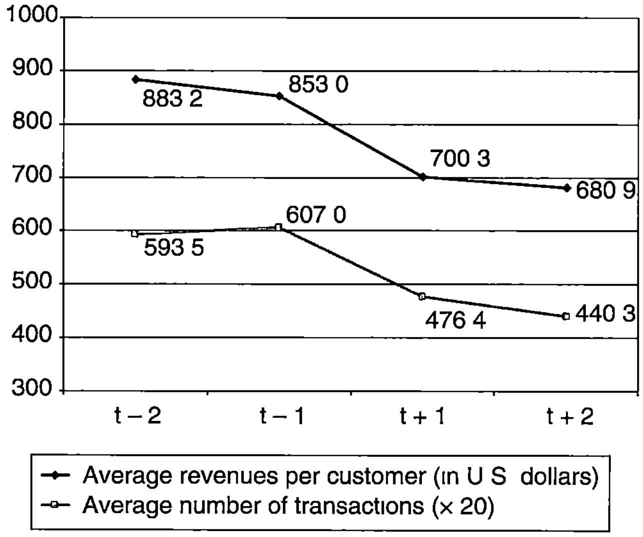
[4] To protect the company's identity, all numbers reported in this part of the article are multiplied by a constant factor

Results

Regarding the customers' reactions to status demotion, Figure 2 depicts the mean scores of the demoted customers' amount spent and number of transactions in our data set for the two years before the demotion (i e , t – 2 and t – 1) and the following two years (i e , t + 1 and t + 2) Both revenues and transactions clearly decrease after the demotion (compared with the same period in the year before the demotion), with revenues being 17 9% lower and transactions being 21 5% lower We run t-tests to test the significance of this decrease, both changes are highly significant (revenues $p < 001$, t(2844) = 7 261, transactions $p < 001$, t(2814) = 7 94) We also test the change in revenues and transactions between t – 2 and t – 1 (the periods preceding demotion) and between t + 1 and t + 2 (the periods following demotion) Predemotion differences are nonsignificant (revenues t(2763) = 1 337, transactions t(2844) = – 078) The difference in revenues between the two postdemotion states is also nonsignificant (t(2824) = 86), but the decline in transactions is significant, though smaller than immediately after demotion ($p < 05$, t(2844) = 2 31) These results strongly suggest that the decline in revenues and transactions observed after the demotion is mainly caused by the demotion act itself rather than by any kind of trend This is also supported by t-tests of the differences in revenues and transactions following the demotion and the predemotion and postdemotion differences, which show that the effects immediately following demotion are significantly stronger than those before and after the demotion act (predemotion versus demotion revenues $p < 001$, t(2785) = 4 549, transactions $p < 001$, t(2826) = 8 46, postdemotion versus demotion revenues $p < 001$, t(2842) = 5 427, transactions $p < 001$, t(2774) = 6 22)

FIGURE 2
Study 2: Revenue and Transactions of Demoted Customers



To test for potential effects of relationship and consumer variables that may provide an alternative explanation of the decline in revenues and transactions, we run regressions with the change in revenues and transactions, respectively, as dependent variable and the following variables as regressors length of gold status (in years), relationship length (in years), and gender and age as customer characteristics For change in revenues, the regression function explains only 3% of the dependent variable and is nonsignificant (F = 1 20) The change in transactions regression explains only marginally more variance ($R^2 = 05$) and is also nonsignificant (F = 1 62) We conclude that neither alternative relationship variables nor customer characteristics explain the decline in revenues and transactions that emerge in the data after consumers are degraded, which supports the external validity of the laboratory experimental findings of Study 1

Because H_1 suggests an asymmetric effect of status demotion compared with a status upgrade, we also analyze customers' reactions to a status upgrade, using the data from customers upgraded in 2006 We find that revenues do not increase at all as a reaction to the gold card status Customers spent $2,432 8 on average in the five-month period before the status upgrade and $1,735 5 in the same period a year later The same pattern can be found for the number of transactions, whereas the customers in our sample purchased 45 9 times in the preupgrade period, they purchased only 39 5 times after being upgraded These results do not reflect the expected positive effect of the status increase on customers but show that customers actually buy less, despite their status being upgraded

We believe that this finding is specific to our outcome variables of revenues and transactions and would not exist for customer loyalty intentions Likewise, recent research has suggested that the actual spending levels of "heavy users" of a service provider, such as the elevated customers in this field study, are not positively influenced by tiered rewards provided by loyalty programs (Liu 2007) The current findings suggest that the high revenues that led to the status increase reflect exceptional one-time constellations for a substantial number of customers, who have difficulty maintaining such spending levels However, note that our results cannot rule out that customers would have shopped less in the postupgrade period with the company even if their status had not been increased, because customer lifetime value models usually assume a retention rate of less than 1, which implies a continuous downward slope of revenues over time for a given cohort of customers (Kumar and Reinartz 2006), the status increase might have diminished the function's slope A comparison of the postupgrade and predemotion revenues and transactions, even though they result from two samples and may be biased by seasonal effects, supports the existence of this downward slope, the decline of which is substantially strengthened by customer demotion

In summary, our initial experiment supports our proposition that demotion has the potential to drive loyal customers away from a company through different psychological mechanisms Our analyses of company sales data show that the negative effect of demotion can also affect actual spending behavior This raises the question whether firms can mitigate (or even completely compensate for) the potentially harmful consequences of customer demotion when they design their hierarchical loyalty programs Next, we propose and test the effectiveness of measures that companies can deploy to reduce such negative effects

Alleviating the Pain: Can Loyalty Program Design Variables Reduce the Negative Consequences of Customer Demotion?

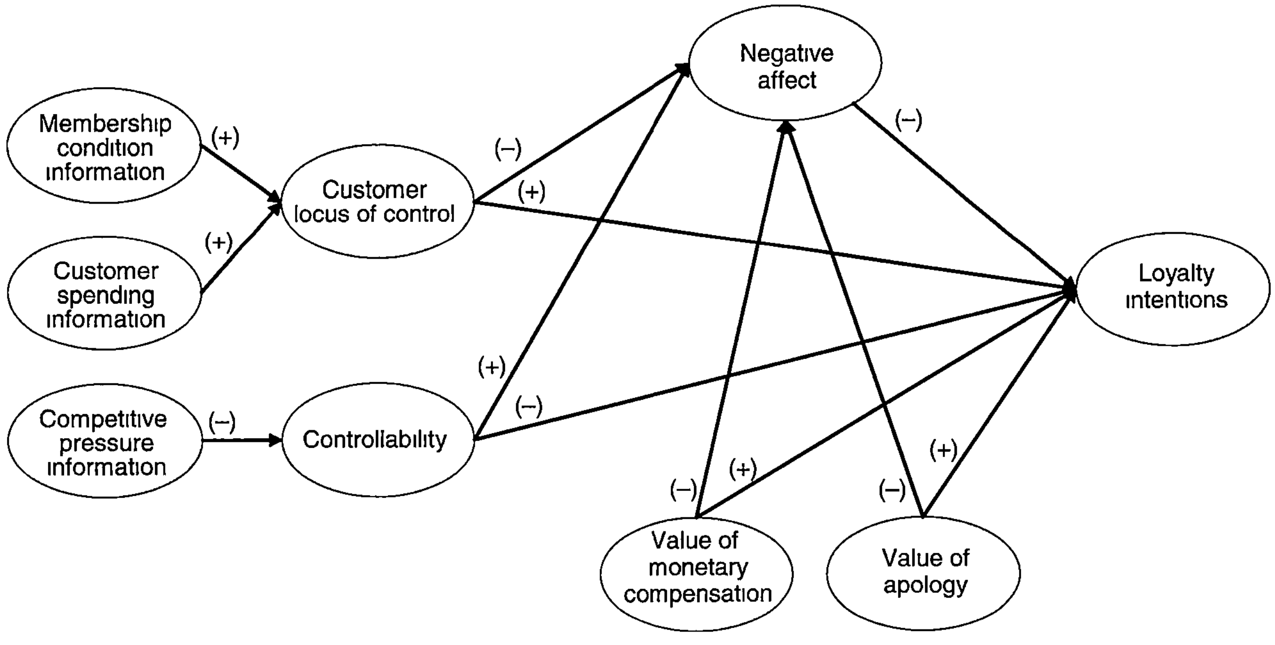
Customers tend to search for information that helps them comprehend the underlying causes that trigger negative events (Kelley and Michela 1980) This impulse offers companies an opportunity to modify customers' causal attributions by manipulating the information available to them (Folkes 1987) Causal attributions refer to people's perceptions about who or what is responsible for certain events, and they serve as important determinants of consumers' respective affective and behavioral responses (Poon, Hui, and Au 2004) Attribution theory explains causal attribution, proposing that an event (e g , negative service incident) prompts a sequence of (1) causal antecedents, (2) causal dimensions, (3) affect, and (4) behavior (Weiner 1985)

In our discussion as to which loyalty program design variables service companies can use effectively to manipulate customers' causal attributions for their demotions (for a similar approach, see Bitner 1990), we concentrate on two causal dimensions—namely, locus of control and controllability—and introduce the design variables of membership condition information, customer spending information, and competitive pressure information, all of which the fictitious company in Study 1 did not use We refrain from manipulating the causal dimension of status stability, because the customer status awarded by hierarchical loyalty programs varies with customers' spending behavior and thus is unstable by definition In addition, we propose two forms of company compensation that can reduce customers' negative affect and decreases in loyalty intentions monetary and emotional compensation (i e , offering an apology) We expect that some design variables influence loyalty intentions through affect, and therefore we include the latter construct in our model (see Figure 3)

Locus of Control Effects

When consumers believe that they can influence a certain outcome (i e , have an internal locus of control), the inten-

FIGURE 3
Structural Model of Marketing Activities, Causal Dimensions, and Loyalty Intentions


Membership condition information
(+)
Customer spending information
(+)
Competitive pressure information
(–)
Customer locus of control
(–)
(+)
Controllability
(+)
(–)
Negative affect
(–)
Loyalty intentions
Value of monetary compensation
(–)
(+)
Value of apology
(–)
(+)

sity of their feelings toward a third party that is also related to the outcome tends to be weaker (Hui and Toffoli 2002) Such an internal locus of control occurs when a consumer expects a specific outcome because he or she has the information needed to build that expectation, making him- or herself responsible for the outcome (Zuckerman 1979) Specifically, information about "causal rules" influences people's causal attributions (Weiner 1985, p 565) Transferring this rationale into the context of customer demotion, we argue that formal membership conditions, such as a certain spending level (e g , flight miles per year) required to maintain an elevated status, function as the causal rules of hierarchical loyalty programs, so timely provision of information about such membership conditions by the service firm should facilitate an internal locus of control This shift of locus should then reduce the negative affect that results from a status demotion and eventually lead to a lower drop in loyalty intentions

> H_3 When a customer's status is demoted, the provision of information about elevated-status membership conditions decreases the customer's negative affect and increases loyalty intentions through perceptions of an internal locus of control

People's attributions of locus of control also stem from their knowledge of their own behavior (Hansen and Donoghue 1977) For example, people who are aware that they have failed to follow instructions for product usage perceive an internal locus of causality for related product failures (Folkes 1984b) With regard to demotion, a customer's causal attributions related to the locus of control should depend on information about his or her decline in spending with the company as the reason for the demotion Specifically, such information by the service firm suggests that the customer holds personal responsibility for the demotion of his or her status and thus should reduce the stimulation of negative affect and limit the resulting decrease of loyalty intentions

> H_4 When a customer's status is demoted, the provision of information about the customer's decline in spending with the firm decreases the customer's negative affect and increases loyalty intentions through perceptions of an internal locus of control

Controllability Effects

Judgments about the controllability of an event become less pronounced when people acknowledge the situational constraints of the actor that causes the event (Gilbert, Pelham, and Krull 1988) In other words, external explanations of a negative event reduce people's perceptions of controllability (Folkes 1984b) In particular, information about a company's competitive situation can influence customers' perceptions of the controllability of an event (Hunt, Kernan, and Mizerski 1983) Accordingly, we suggest that information about competitive pressure experienced by a company might create a notion of increased uncontrollability, which should decrease customers' negative affect, leading to higher loyalty intentions toward the focal firm (e g , Folkes, Koletsky, and Graham 1987)

> H_5 When a customer's status is demoted, the provision of information about competitive pressures on the firm decreases the customer's negative affect and increases loyalty intentions through perceptions of uncontrollability

Compensation Effects

Companies can also use design variables to reduce the negative consequences of customer demotion more directly Specifically, prior applications of attribution theory in the context of negative consumption experiences indicate that consumers desire financial compensation and apologies from the offending firm (Folkes 1984a) Financial compensation represents monetary value for the recipient, and apologies increase liking and forgiveness (Darby and Schlenker 1982) We expect that monetary compensations and apologies offered by a firm reduce negative affect and increase the loyalty intentions of demoted customers

> H_6 When a customer's status is demoted, monetary compensation offered to the customer by the firm decreases negative affect and increases loyalty intentions
>
> H_7 When a customer's status is demoted, an apology offered to the customer by the firm decreases negative affect and increases loyalty intentions

Study 3: Testing the Effects of Loyalty Program Design Variables

Methodology

Context and dramaturgy We test our loyalty program design variables hypotheses with a second scenario experiment, employing the same industry context (i e , airlines) as in Study 1 The design is a 2 (membership information versus no information) × 2 (customer spending information versus no information) × 2 (competitive pressure information versus no information) × 2 (monetary compensation versus no monetary compensation) × 2 (apology versus no apology) full-factorial between-groups design with 32 experimental groups We report the full manipulations, which extend the background, elevation, and demotion information used in Study 1, in Appendix C After presenting the manipulations, we asked participants to indicate their attributional reactions (i e , locus of causality, controllability), level of negative affect, and loyalty intentions toward Premier Air on a set of rating scales We also included a stable-status group and an elevated-status control group

Measures We use the same scales for negative affect and loyalty intentions as in the first study Our scales for locus of causality and controllability come from Oliver (1997) and McAuley, Duncan, and Russell (1992), respectively, and are slightly modified to fit the context of this research (i e , airline frequent-flier programs) Because consumers maintain different normative expectations about compensation (Bolton and Lemon 1999), we measure the perceived value of the monetary and emotional compensations in our empirical investigation by adapting Yi and Jeon's (2003) scale and thus detect the general effect of our compensation manipulations rather than the idiosyncratic effects of a specific fee or apology We list all the measures used in this study in Appendix B

Sample We apply the same sampling procedure as in Study 1 for the full-factorial design but use a different set of students Again, participants need to be current members of actual frequent-flier programs Overall, 487 participants completed this experiment and were considered usable for data analysis (319 corresponding to the factorial design and 168 to the control groups) Participants were an average age of 43 years, 49% were women, and 49% had attended at least some college

Manipulation and Realism Checks

We asked respondents whether they believed that they had received information regarding membership conditions, customer spending, and competitive pressure on a scale from 1 ("absolutely false") to 7 ("absolutely true") For example, we measure respondents' perceptions of membership condition information with the statement "When I was first awarded Elite Member status, I was informed by Premier Air about the formal requirements to maintain that status " The ANOVA results show that all mean differences are statistically significant and in the expected direction (F-values range from 7 70 to 90 60, all $ps <$ 01) We also test for confounding effects The only potentially confounding relationship is a significant effect of membership condition information on customer spending information (F(1, 287) = 10 94, $p <$ 001) However, this unintended manipulation corresponds to an effect size of a partial $\eta^2 =$ 03, which is much smaller than the effect size of the desired effect (partial $\eta^2 =$ 24) and, according to Perdue and Summers (1986, p 323), should "not be of great concern " We again asked respondents to judge the realism of our experimental scenarios, using the same items as in Study 1 As in our first experiment, the results suggest that participants perceived the experimental design as realistic ($M_{\text{composite score}} =$ 5 86, SD = 1 45)

Validity Assessment

We again assess the measurement properties of all dependent variables with a confirmatory factor analysis (LISREL 8 71), which indicates a good overall fit of the model ($\chi^2(67) =$ 109 83, $p <$ 001, root mean square error of approximation = 04, nonnormed fit index = 99, comparative fit index = 99) and solid psychometric properties of our scales Specifically, all standardized factors loadings have a positive sign and substantial magnitude, ranging between 76 and 97 Each loading is significant at $p <$ 001, in support of convergent validity The composite reliabilities demonstrate values between 89 and 95, alphas range from 90 to 95, and AVEs vary from 68 to 82 All construct pairs achieve discriminant validity (Fornell and Larcker 1981) Descriptive statistics and correlations for this study appear in Table 3

Results

We first compare the combined sample of respondents who experienced a status demotion with the stable-status and elevated-status control groups The results are consistent with Study 1, and ANOVAs provide additional evidence that customer demotion can harm healthy relationships with customers Specifically, loyalty intentions scores are significantly lower for demoted customers ($M_{DS} =$ 4 50) than for both stable-status ($M_{SS} =$ 5 92, F(1, 384) = 37 88, $p <$ 001) and elevated-status ($M_{ES} =$ 6 25, F(1, 418) = 88 02, $p <$ 001) customers

When we compare the loyalty intentions means of demoted customers exposed to one of the five manipulations with those of elevated-status and stable-status customers, we find that loyalty intentions are higher for four of the five manipulations compared with demoted customers with no positive manipulation, which suggests that loyalty program design variables can indeed mitigate the negative effects of customer demotion to a certain extent (see Table 4) However, customers who were neither demoted nor elevated exhibited higher loyalty intentions than those who were exposed to one or even all relevant loyalty program design variables, so the power of these actions appears limited in its effect

Next, to test the relationships proposed in H_3–H_7, we use the demotion scenarios and apply PLS The results appear in Table 5 Regarding the links between loyalty program design variables and causal dimensions, our findings suggest that membership condition information ($\gamma =$ 19, t = 3 53) and customer spending information ($\gamma =$ 20, t = 3 94) increase perceptions of an internal locus of control, as H_3 and H_4 propose Consistent with H_3 and H_4, an internal locus of control reduces negative affect ($\beta = -$ 34, t = –6 28)

TABLE 3
Study 3: Correlation Matrix (n = 319)

	M (SD)	CI	MI	CP	CLO	AFF	CO	LOY	EC	AP
Customer spending information (CI)	N A	1								
Membership condition information (MI)	N A	– 01	1							
Competitive pressure information (CP)	N A	– 04	08	1						
Customer locus of control (CLO)	4 19 (2 22)	19**	19**	– 15**	1					
Negative affect (AFF)	4 09 (1 78)	– 05	– 12*	– 02	– 35**	1				
Controllability (CO)	5 40 (1 91)	00	– 04	– 22**	11*	07	1			
Loyalty intentions (LOY)	5 06 (1 79)	07	04	– 09	39**	– 39**	06	1		
Value of monetary compensation (EC)	2 32 (1 80)	00	– 08	– 05	00	00	11*	06	1	
Value of apology (AP)	3 33 (2 06)	04	01	14	06	– 14*	18**	20**	34**	1

*$p <$ 05 (two-tailed)
**$p <$ 01 (two-tailed)
Notes N A = not applicable

TABLE 4
Study 3: Overview of Loyalty Intention Means

			Elevated-Status Control Group (n = 101, M = 6.26)		Stable-Status Control Group (n = 67, M = 5 93)	
Company Measures	**M**	**n**	**F**	***p*** **<**	**F**	***p*** **<**
Membership condition information	4 59	167	(1, 266) = 72 87	001	(1, 232) = 30 25	001
Customer spending information	4 63	157	(1, 256) = 61 36	001	(1, 222) = 25 17	001
Competitive pressure information	4 33	146	(1, 245) = 92 75	001	(1, 211) = 40 92	001
Monetary compensation	4 54	173	(1, 272) = 76 59	001	(1, 238) = 32 31	001
Apology	4 57	168	(1, 267) = 71 07	001	(1, 233) = 29 71	001
All measures[a]	4 77	11	N A[c]	N A	N A	N A
No measures[b]	4 44	13	N A	N A	N A	N A

[a] "All measures" denotes that participants were exposed to all five manipulated conditions, including information pertaining to membership conditions, customer spending, competitive pressure, monetary compensation, and apology

[b] "No measures" denotes that participants were not exposed to any of the five manipulated conditions

[c] N A = significance tests are not applicable because of a limited number of cases in group

TABLE 5
Study 3: Path Coefficients from PLS Analysis

Structural Path	**Estimate**	**t-Value**	**Total Impact**	**R²**
Effects on Causal Dimensions				
Membership condition information → customer locus	19**	3 53	19	08
Customer spending information → customer locus	20**	3 94	20	
Competitive pressure information → controllability	– 23**	–4 43	– 23	05
Effects on Negative Affect				
Customer locus → negative affect	– 34**	–6 28	– 34	14
Controllability → negative affect	01	21	01	
Value of monetary compensation → negative affect	06	1 04	06	
Value of apology → negative affect	– 14*	–2 38	– 14	
Effects on Loyalty Intentions				
Customer locus → loyalty intentions	27**	4 96	37	25
Controllability → loyalty intentions	– 02	– 33	– 01	
Value of monetary compensation → loyalty Intentions	01	21	00	
Value of apology → loyalty intentions	15*	2 49	19	
Negative affect → loyalty intentions	– 28**	–4 93	– 28	

*$p <$ 05 (two-tailed)
**$p <$ 01 (two-tailed)

and increases loyalty intentions ($\beta =$ 27, t = 4 96) Accordingly, we find full support for H_3 and H_4 However, while competitive pressure information indeed negatively affects the notion of controllability ($\gamma =$ – 23, t = –4 43), as H_5 proposes, the relationships between controllability and both negative affect and loyalty intentions are insignificant, meaning that information about competitive pressure does not reach these outcome variables, which is in conflict with H_5 The rationale for this lack of impact of controllability may be that the formal requirements and assured benefits of loyalty programs are perceived as contractual in nature by consumers (Rowley 2007), thus potentially eliciting little sympathy for firms struggling with their self-imposed rules The value of the monetary compensation has no impact on either outcome variable, which does not support H_6 However, the value of an apology reduces the customer's negative affect ($\gamma =$ – 14, t = –2 38) and directly increases his or her loyalty intentions toward the firm ($\gamma =$ 15, t = 2 49), in full support of H_7 The difference in impact of apologies and monetary compensations is in line with research that suggests that social benefits, such as personal communication by service firm representatives, affect customers' commitment to and, thus, loyalty toward firms to a greater extent than economic incentives (Hennig-Thurau, Gwinner, and Gremler 2002) Finally, negative affect again reduces customer loyalty intentions ($\beta =$ – 28, t = –4 93)

In summary, the results of Study 3 suggest that customers' perceptions of locus of control and controllability can be manipulated by deploying relevant loyalty program design variables However, the impact of these two causal dimensions on customers' experiences of negative affect and loyalty intentions differs Whereas a perceived internal locus of control increases loyalty intentions both directly and indirectly by reducing the negative affect caused by demotion incidents, controllability does not influence any of the outcome variables significantly The two compensation measures included in our study also differ in their potential to reduce negative affect and increase loyalty intentions. While the value of a monetary compensation does not appear to exert any impact on these outcome variables, the value of an apology reduces demoted customers' negative affect and increases their loyalty intentions, both directly and indirectly through affect. At the same time, even when we find significant relationships, the absolute size of the effects appears limited, meaning that the loyalty program design variables can only partially compensate for the overall negative impact caused by customer demotion.

Managerial Implications: Deciding When and How to Demote

Whereas hierarchical loyalty programs have been implemented in several service industries for many years, marketing academics have just recently began acknowledging differentiations in customer status as a crucial relationship management variable (e.g., Wangenheim and Bayon 2007). The initial findings suggest that elevated-status customers tend to demonstrate certain desired characteristics, such as more pronounced intentions of future purchases (Dreze and Nunes 2007; Lacey, Suh, and Morgan 2007) and superior satisfaction with the firm, compared with standard customers (Homburg, Droll, and Totzek 2008). What has remained unexplained, however, is the dark side of such status differences—namely, the demotion inherent with the concept of status differences commonly imposed by service firms on thousands of customers every day. As a first step toward closing this gap, studying customers' psychological and behavioral responses to relationship status reductions appears to be highly relevant for marketing researchers and practitioners alike.

Using two experimental investigations and a field study of proprietary company data, we apply ANOVA and PLS and find that status demotion exerts an overall asymmetric negative effect on customer loyalty intentions, such that the negative impact of status decreases is stronger than the positive influence of status increases. We test how service firms can mitigate the harmful consequences of customer demotion when they design their loyalty programs and find that firms can indeed manipulate customers' causal attributions, but only a perceived internal locus of control and personal apologies offered to demoted customers reduce decreases in loyalty intentions to a certain extent.

To derive better assessments of whether hierarchical loyalty programs are economically reasonable and how they should be structured, firms must analyze how status increases and decreases affect their success. We address this issue, proposing an analytical model with the purpose to aid respective managerial decision making (Thompson, Hamilton, and Rust 2005).

The Effects of Customer Demotion on Customer Equity

The analytical model links customer demotion to customer equity, a key element of firm value from a strategic perspective (e.g., Rust, Lemon, and Zeithaml 2004). For that purpose, we compare the effects of a bidirectional hierarchical customer loyalty program (BHLP), in which customers are both upgraded and demoted, on customer equity with two strategic alternatives to such a program: (1) a nonhierarchical loyalty program in which customers are neither upgraded nor demoted (NHLP) and (2) a unidirectional hierarchical customer loyalty program (UHLP) in which customers are only upgraded but not demoted. In line with the rationale of our empirical studies, we model upgraded customers U, demoted customers D, and regular (i.e., neither upgraded nor demoted) customers R as separate groups, all being members of the company's loyalty program. Their customer lifetime value, weighted with the respective group size, determines the company's customer equity:

$$(1)\qquad CE = N \times \sum_{G} w_g \times CLV_g,\ \left\{0 \le w_g \le 1, \sum_{G} w_g = 1\right\},$$

where CE is the firm's customer equity, CLVg is the average customer lifetime value per member of group g, w is the size of a group, G are the groups (with U, D, R $\in$ G), and N is the total number of customers the company has, which we assume to be constant over time. We define each group's customer lifetime value as follows (Berger and Nasr 1998):

$$(2)\qquad CLV_g = \left(S_g - C_g\right) \times \sum_{t=1}^{\infty} \frac{r_g^t}{(1+d)^t},\ \{0 \le r \le 1\},$$

where r is the retention rate for each group g per period t, d is the discount rate, S are the average sales per member of a group, and C are the average marketing costs per member of a group. The marketing costs result from the loyalty program and other marketing activities of the firm. The difference between S and C represents the contribution margin.[5] We assume that r values are equal for R and for customers of a firm that does not offer such a program. Studies 1 and 3 provide evidence that both the elevation and the demotion of customer status influence customer loyalty intentions, which can be translated into customers' retention rate r (Gupta and Zeithaml 2006). More specifically, our experimental findings suggest that $r_U > r_R > r_D$ and that the effect of demotion is asymmetric (i.e., $r_U - r_R < r_R - r_D$). Study 3 also shows that the latter condition is true regardless of the design of the upgrading and demotion process. Furthermore, we assume that the customers' sales are not affected by the existence of a hierarchical loyalty program and that, as customers are upgraded according to their sales, sales are higher for U than for both D and R (i.e., $S_U > S_R, S_D$). Regarding costs, the different groups U, D, and R differ in terms of marketing costs, with the average costs per member of U being higher than those for both members of R and D (i.e., $C_U > C_R, C_D$) as a result of the additional benefits offered to upgraded customers. In addition, average marketing costs per member of R are equal to average marketing costs for customers who are NHLP members.

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[5] Note that estimating the retention rate for customers in noncontractual settings "might be an especially daunting task" (Villanueva and Hanssens 2007, p. 9). Several different methods have been suggested in the customer lifetime value literature to accomplish this task, but it is beyond the realm of our analytical modeling to include them in our argumentation. The company in our empirical case, as well as several airlines, solves this challenge by offering a "basic" customer card, which enables the company to track the purchases of a majority of its customers even when no formal "contract" exists.

Comparing the effects of BHLP and NHLP. To generate higher customer equity than a nonhierarchical program, the weighted total customer lifetime value of the three groups of the BHLP must be higher than the total NHLP. Formally,

$$w_R \times (S_R - C_R) \times \sum_{t=1}^{\infty} \frac{r_R^t}{(1+d)^t} + w_U \times (S_U - C_U) \times \sum_{t=1}^{\infty} \frac{r_U^t}{(1+d)^t} + w_D \times (S_D - C_D) \times \sum_{t=1}^{\infty} \frac{r_D^t}{(1+d)^t} > (S_{NHLP} - C_{NHLP}) \times \sum_{t=1}^{\infty} \frac{r_{NHLP}^t}{(1+d)^t} \tag{3}$$

Whether this condition is met depends on the size of three effects: (1) a positive effect on the customer equity of the BHLP that stems from the higher retention rate for upgraded customers, (2) a negative effect on the customer equity of the BHLP as a result of the lower retention rate for demoted customers, and (3) another negative effect on the customer equity of the BHLP caused by the higher marketing costs (and, consequently, the lower average contribution margin) for upgraded customers. Formally,

$$r_U - r_{NHLP} \rightarrow \Delta CE_1, \tag{4}$$

$$r_{NHLP} - r_D \rightarrow \Delta CE_2, \text{ and} \tag{5}$$

$$C_U - C_{NHLP} \rightarrow \Delta CE_3 \tag{6}$$

A first finding of our analytical model is that the BHLP generates higher customer equity than the NHLP if ΔCE_1 exceeds the sum of ΔCE_2 and ΔCE_3. Because of the asymmetric effect of demotion shown in Studies 1 and 3, a positive total effect can exist only if the number of upgraded customers w_U (and, consequently, ΔCE_1) is higher than the number of demoted customers w_D (and, consequently, ΔCE_2), which constitutes a second finding. The relative group sizes can be actively influenced by the company through manipulating the conditions under which customers are elevated and under which they are demoted, such as the minimum spending level required for a higher status (i.e., higher spending levels reduce the number of upgraded customers) and the length of status upgrade intervals (i.e., longer intervals reduce the number of demoted customers). In addition, the incremental marketing costs for the upgraded customer group must be considered. Even if w_U is greater than w_D, a positive total effect of the BHLP requires the retention rate–based increase in customer equity (i.e., $\Delta CE_1 - \Delta CE_2$) for upgraded customers to be greater than the cost-based decrease in customer equity (i.e., ΔCE_3), which represents our third finding. Because Study 1 demonstrates that perceived benefits fully mediate the effect of status upgrades on retention, lowering the marketing costs for U is not an easy solution, because it will not only reduce ΔCE_3 but also alleviate ΔCE_1.

Comparing the effects of BHLP and UHLP. Would it be a solution only to upgrade but not to demote customers (i.e., using the positive effects of upgrading and avoiding the negative effects of demotion)? To address this question, we compare the standard BHLP with the UHLP. The latter program would contain one additional group of customers, U*—customers who have been upgraded but who no longer meet the upgrading requirements but are still treated preferentially. It is important to consider this group, because the average sales per member S_{U*} are equal to those of the demoted customer group S_D of the BHLP but lower than the average sales per member of the "regular" upgraded customers S_U. In this case, the UHLP would need to meet the following condition:

$$w_R \times (S_R - C_R) \times \sum_{t=1}^{\infty} \frac{r_R^t}{(1+d)^t} + w_U \times (S_U - C_U) \times \sum_{t=1}^{\infty} \frac{r_U^t}{(1+d)^t} + w_{UN} \times (S_{U*} - C_{U*}) \times \sum_{t=1}^{\infty} \frac{r_{U*}^t}{(1+d)^t} > w_R \times (S_R - C_R) \times \sum_{t=1}^{\infty} \frac{r_R^t}{(1+d)^t} + w_U \times (S_U - C_U) \times \sum_{t=1}^{\infty} \frac{r_U^t}{(1+d)^t} + w_D \times (S_D - C_D) \times \sum_{t=1}^{\infty} \frac{r_D^t}{(1+d)^t}, \tag{7}$$

where the term before the greater than sign is the customer equity of the UHLP and the term after the sign is the customer equity of the BHLP. The U* group has a lower contribution margin than demoted customers as a result of the higher marketing costs for upgraded customers, but this group exhibits a higher retention rate. Formally,

$$r_{U*} - r_D \rightarrow \Delta CE_4, \text{ and} \tag{8}$$

$$C_{U*} - C_D \rightarrow \Delta CE_5 \tag{9}$$

If we assume that all other parameters are equal, the UHLP is superior to the BHLP if the retention rate–based effect on customer equity is greater than the cost-based effect (i.e., $\Delta CE_4 > \Delta CE_5$); this is our fourth finding. Finally, note that even if this condition is met, the UHLP must also generate higher customer equity than the NHLP to make sense economically. If the condition given in Equation 3 is not met by the BHLP, the difference in customer equity between the UHLP and the BDHL (see Equation 7) must exceed the difference in customer equity between the NHLP and the BDHL (see Equation 3), which represents our fifth finding.

Handling the Demotion Process

Although firm-specific applications of the discussed analytical principles may suggest that the elevation and demotion of customer status is not economically reasonable, it must be acknowledged that in many service industries, the awarding of such preferred status to high-spending customers frequently occurs simply for reasons of competitive parity, and it is unrealistic to expect that customer status demotions can be largely avoided in general However, many service firms award elevated customer status in one-year periods, such that initially elevated customers frequently lose their status after one year Because making reliable assessments about customers' contributions to firms' profits based on such brief periods tends to be problematic (Venkatesan, Kumar, and Bohling 2007), it is possible that the loyalty of far too many potentially valuable customers is jeopardized by demoting them prematurely In addition, people may feel that they were not given a fair chance to prove themselves as valuable customers within such a limited time frame, which may lead to perceptions of unfairness, another critical psychological mechanism in customer–company relationships Given the substantially negative consequences following incidents of status demotions, we suggest that firms implement longer periods of status elevation We speculate that minimizing the risk of driving away valuable customers outweighs the additional marketing costs of extending elevated status for another year or two

Companies should aggressively attempt to maximize the salience of an internal locus of control by reminding customers proactively of both their spending decline and the formal requirements to maintain an elevated status We find it remarkable that some companies (e g , Lufthansa) have begun to offer customers who are about to be demoted the opportunity to purchase the revenues (e g , flight miles) that are "missing" to maintain their elevated status Such an offer clearly contributes to an internal locus because customers are enabled to maintain their status actively instead of simply having to accept the company's decision In addition, our findings demonstrate that offering customers an apology (e g , through a letter) is a much more efficient marketing tool in a degradation context than providing monetary compensation This finding is especially noteworthy because apologies are much cheaper for a company than offering financial forms of compensation

Limitations and Further Research

Although this study provides initial insights into the psychological and behavioral consequences of changes in service customers' relationship status, subsequent research efforts are needed to gain additional insights into this issue Foremost, the effectiveness of varying configurations of hierarchical loyalty programs needs to be studied in more detail For example, future work could investigate the dynamics caused by status changes among more differentiated hierarchical levels with several elevated-status designations Likewise, other research could examine the effectiveness of varying lengths of initial status qualification periods and compare various time frames of (minimum) elevated-status membership, as well as incorporating costs into the analysis At a more fundamental level, it is important to investigate the extent to which loyalty programs in general and customer status differentiations indeed create "true" customer loyalty instead of providing incentives of a short-term nature to choose a certain service provider (i e , spurious loyalty, Dick and Basu 1994) Further research could also incorporate a wider array of psychological variables into theoretical explanations of customers' reactions to status changes For example, the potentially moderating impact of relevant personality traits on status change outcomes represents an avenue for further research Relatedly, it would be worthwhile to account for potential additional effects of attributions in the context of relationship status changes (e g , positive outcomes) Regarding the samples of our two experimental studies, we included only consumers who were experienced with airline loyalty programs, we did not limit our study to those whose status had been elevated by an airline in real life Although our description of benefits exclusively offered to elevated customers is based on a content analysis of actual bonus programs, which should ensure a high level of external validity, it would be worthwhile to determine whether customers' actual experience has any influence on the results Although our analytical procedures suggest that demand artifacts are no substantial threat to our experimental findings, it must be acknowledged that all behavioral experiments are subject to demand artifacts to some extent (Argyris 1968), thus representing a methodological limitation Finally, although our analytical model provides important insights into the economic consequences of hierarchical loyalty programs, further research could clearly extend the model by testing its assumptions and by empirically estimating its parameters

Appendix A
Study 1: Background Information and Manipulations

Initial Background Information (Stable-, Elevated-, and Demoted-Status Groups)

Premier Air is one of the largest airline companies in the world, connecting all major airports around the globe

As a frequent customer of Premier Air, you have been enrolled in the company's frequent-flier program ever since you started flying with them 5 years ago The frequent-flier program allows you to accumulate flight miles and to redeem those miles on future flights

You have been flying frequently with Premier Air and enjoyed it

Status Elevation Manipulation (Elevated- and Demoted-Status Groups)

Two years ago, the company elevated you to Elite Member status because you have been such a loyal customer As an Elite Member you get preferred customer treatment The benefits of being an Elite Member include

- You are often bumped up to fly Business Class or even First Class for free,
- You are allowed to use the company's exclusive *Elite Member* airport lounges, which allow you to relax in a pleasant setting and to enjoy a selection of complementary beverages, snacks, and newspapers,
- You are guaranteed a seat on board when requesting it up to 48 hours before departure,
- You are invited to enter the airplane before the standard customer, and
- You have access to a special telephone hotline for preferred customers where you can make reservations and get your questions answered by specially qualified and courteous service personnel

Status Demotion Manipulation (Demoted-Status Group Only)

Over the last 12 months, you have continued to travel frequently with Premier Air, but not quite as much as in previous years

Today you receive a letter by Premier Air's customer service department It tells you that your customer status has been reduced From today on, you are no longer an Elite Member

APPENDIX B
Studies 1 and 3: Measures

Construct	Items	CR/AVE[a]	Based on
	What benefits do you gain from being a customer of this airline?[b]		
Convenience benefits (Study 1)	•Being a customer of this airline makes my traveling more convenient •Being a customer of this airline makes me save time and effort •Being a customer of this airline allows me to travel with lesser effort •Being a customer of this airline makes my traveling easier	97/ 87[f]	Morganosky 1986, Paul et al 2009
Recognition benefits (Study 1)	•Being a customer of this company makes me feel privileged compared to others •Being a customer of this company makes me feel special compared to others •Because I am a customer of this company others look up to me •Being a customer of this company makes me demonstrate greater success than others	90/ 69[f]	Netemeyer, Burton, and Lichtenstein 1995, Paul et al 2009
	The status reduction[c]		
Customer locus of control (Study 3)	•Occurred because of something I did/occurred because of something the airline did (R) •Was caused by me/was caused by the airline (R) •Is due to my behavior/is due to the airline's behavior (R)	93/ 81[g]	Oliver 1997
Controllability (Study 3)	•Was not controllable by the airline/was controllable by the airline •Is something the airline had no power over/is something the airline had power over •Could not have been regulated by the airline/could have been regulated by the airline	93/ 82[g]	McAuley, Duncan, and Russell 1992
	Did you receive any compensation of value to you by the airline?[d]		
Value of compensation (Study 3)	•I received an economic compensation by the airline which has a high cash value for me •I received an apology by the airline which has a high emotional value for me	N A	Yi and Jeon 2003
	How does this situation make you feel?[b]		
Negative affect (Studies 1 and 3)	•Angry •Frustrated •Irritated •Annoyed	97/ 88[f] 89/ 68[g]	Larsen and Diener 1992, Richins 1997

APPENDIX B
Continued

Construct	Items	CR/AVE[a]	Based on
	How would you behave based on this experience?[e]		
Loyalty intentions (Studies 1 and 3)	•I would continue flying with this airline •The next time I need to air travel, I would fly with this airline •I would consider this airline my first choice to air travel •I would use the services of this airline in the next years	97/ 89[f] 95/ 82[g]	Agustin and Singh 2005, Johnson, Herrmann, and Huber 2006, Zeithaml, Berry, and Parasuraman 1996

[a] CR = construct reliability, and AVE = average variance extracted

[b] We obtained responses using seven-point scales, anchored by "disagree completely" (1) and "agree completely" (7)

[c] We obtained responses using seven-point bipolar scales, anchored by the statement mentioned first (1) and the statement mentioned second (7)

[d] We obtained responses using seven-point scales, anchored by "absolutely false" (1) and "absolutely true" (7)

[e] We obtained responses using seven-point scales, anchored by "very unlikely" (1) and "very likely" (7)

[f] We obtained measurement properties from Study 1

[g] We obtained measurement properties from Study 3

Notes N A = not applicable, and (R) = reverse scored

Appendix C
Study 3: Manipulations

Membership Condition Information (Presented Following the Status Elevation Information)

Along with the information on your Elite Member status, you were informed that in order to maintain this preferred customer status, you are required to fly at least 25,000 miles every year with Premier Air

Customer Spending Information (Presented Following the Status Degradation Information)

The reason given in the letter is that you flew less than 25,000 miles within the last 12 months and, hence, do not meet the requirements for being an Elite Member

Competitive Pressure Information (Presented Following the Status Degradation Information)

The letter informs you that Premier Air is currently facing dramatic competitive pressure To avoid bankruptcy, the company is forced to reduce costs and can afford to have only a limited number of Elite Members

Apology (Presented Following the Status Degradation Information)

Dave Smith, CEO of Premier Air, has added and personally signed the following postscript "I wish to personally apologize for this inconvenience We appreciate having you as a customer and look very much forward to serving you in the future"

Monetary Compensation (Presented Following the Status Degradation Information)

Enclosed with the letter, you find a $30 gift certificate for future Premier Air flights issued to your name as a compensation for potential inconveniences

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Suraj Commuri

The Impact of Counterfeiting on Genuine-Item Consumers' Brand Relationships

An often-overlooked constituent in the debate on counterfeiting is the consumer of the genuine article—a brand manager's primary constituent These consumers are drawn to premium brands in part because of the exclusivity and connotation of prestige associated with them These characteristics are also the reason such brands are attractive targets of counterfeiting When premium brands are counterfeited, which in turn gives a variety of consumers access to them, how do consumers of the genuine items react to the erosion of exclusivity and prestige? An investigation involving premium brands in Thailand and India reveals that consumers of genuine items adopt one of three strategies when faced with the prospect of their favorite brands being counterfeited flight (abandoning the brand), reclamation (elaborating the pioneering patronage of a brand), and abranding (disguising all brand cues) The author examines these strategies in detail, revealing how the potential loss of exclusivity and prestige can either drive genuine-item consumers away from the brand or impel them to make strong claims to their patronage

Keywords counterfeits, counterfeiting, brand relationships, conspicuous consumption, fashion, competitive consumption

Firms invest substantially in building their brands In some product categories, such efforts are aimed at making a brand prestigious and exclusive For brands to be perceived as such, they must be widely popular but not widely accessible Paradoxically, such necessary disparity between popularity and accessibility is also the impetus for counterfeiting In other words, the more a firm invests in building a prestigious brand, the more likely the brand is to be counterfeited Too little is known about the impact of counterfeiting prestigious brands on the brand relationships of consumers of the genuine item

Genuine-item consumers are a brand manager's primary constituency and thus should be a decisive preoccupation Understanding how counterfeiting affects a genuine-item consumer is a vital first step in preserving that consumer's relationship with the brand when the counterfeiting occurs Because brands have meaning at an individual level (Rust, Zeithaml, and Lemon 2004), it is not expedient to assume that as they gain popularity among a diverse family of consumers, all consumers are equivalently glad

Counterfeits and Knockoffs

Dyer (2006) estimates that counterfeiting and illegal trade offset the sales of genuine items by between $15 billion and $50 billion annually Another estimate, which includes pirated goods, lists the figure as high as $250 billion (United States Senate Committee on Homeland Security and Governmental Affairs 2005) In addition to counterfeits, which impersonate a brand, knockoffs pose another threat to the exclusivity to which premium brands aspire Knockoffs do not impersonate the brand but merely copy the design and appearance of premium labels For example, while a Tory Burch dress may retail for $750, the same design is offered under Bloomingdale's private label for $260 According to Wilson (2007), such design knockoff garments represent a market worth $9 billion Both counterfeits and knockoffs impose the same penalty on genuine-item consumers They threaten the exclusivity that accompanies the purchase of a premium brand

Previous research on the topic has largely pertained to the economic impact of counterfeiting and piracy (Chaudhury and Walsh 1996, Givon, Mahajan, and Muller 1995, Green and Smith 2002, Shultz and Saporito 1996), legal implications (Zaichkowsky 1995), and attitudes, motivations, and behaviors of consumers of counterfeits (Albers-Miller 1999, Bloch, Bush, and Campbell 1993, Cordell, Wongtada, and Dieschnick 1996, Grossman and Shapiro 1988, Wilcox, Kim, and Sen 2009, Zaichkowsky 2006) The impact of counterfeiting on consumers of genuine items has not received much attention so far because of the undetermined status, both conceptually and legally, of their loss in utility Understanding how these consumers view

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counterfeits and what they do when the counterfeits proliferate is a vital first step and the purpose of this research

Theoretical Grounding

Part of the reason some brands are sought after more than others lies in the signals they communicate in the marketplace Exclusivity, prestige, and privilege are the signals that popularly counterfeited brands commonly communicate Brand signals are important to consumers, who sometimes embrace a brand to signal that they themselves possess the traits and meanings it confers (Belk 1988, Bushman 1993, Corneo and Jeanne 1997, McCracken 1986) Underlying such a thesis of signaling is the requirement that only a few consumers have access to the brand That is, if everyone had access, there would be neither any use for nor value in signaling Over time, consumers who want to be exclusive adopt brands that advance favorable interpersonal comparisons, and followers who aspire to intragroup belongingness adopt the same brands This process eventually undermines the native exclusivity of the brands in question

From a marketer's standpoint, price premium plays a crucial role in communicating and preserving exclusivity and prestige, as well as keeping the brand out of mass consumption It is perhaps one of the easiest and least controversial approaches to allowing access to a few consumers while leaving others out Prices of prestigious brands likely rise disproportionately in the face of growing spending power because of the necessity to maintain their distinction This emphasis on higher prices for such brands is also vindicated in consumer behavior, such that "more snobs might buy as price increases" (Amaldoss and Jain 2005, p 1450, see also Leibenstein 1950) The goal of such behavior is either to ostracize others socially by using the brand as a signal of wealth or to avoid such ostracism themselves (Corneo and Jeanne 1997), either goal leads to an upward-sloping demand Consumers who are able to access prestigious brands send a robust variety of cultural signals throughout the marketplace that turn them into models of aspiration Consequently, they become targets of "infocopying" (Henrich and Gil-White 2001), whereby consumers of different stations desire to copy those behaviors, even when they lack the requisite purchasing power

Counterfeits and knockoffs address the limitation of purchasing power because they typically cost a fraction of what the genuine items cost Previous research appears to converge on the premise that when this happens, the genuine item's equity is compromised Building on prior evidence that counterfeits are often of lower quality, Zaichkowsky (1995) proposes that consumers who are unaware of brand cues and distinction, and thus are deceived into purchasing a counterfeit or knockoff, attribute the lower quality to the brand itself, thus devaluing the brand's equity Conversely, when consumers willingly purchase counterfeits that are not necessarily inferior in quality to the genuine item, they do not have a reason for dissatisfaction with their purchase Under such conditions, unable to perceive the additional value associated with the higher price of the genuine item, consumers begin to question its merit Therefore, whether counterfeits are of subpar or equivalent quality and whether consumers purchase them willingly or unwittingly, counterfeits appear to unanimously imperil the equity of the genuine item

However, little is known about the impact of counterfeiting on consumers who choose the genuine item over a counterfeit Although it is now widely accepted that "a single good will possess more than one characteristic, so that the simplest consumption activity will be characterized by joint outputs" (Lancaster 1966, p 133), the genuine-item buyer is seldom considered to have experienced a loss of utility when counterfeits swell, as if to imply that these consumers have received a suitable trade with the receipt of the physical good Yet, as Reder (1947, p 64) proposes, "the utility function of one individual contains, as variables, the quantities of goods consumed by other persons," thus turning consumption of prestigious brands competitive In addition, consumer–brand relationships are a matter of perceived goal compatibility between the brand and the consumer (Fournier 1998) In the case of genuine-item consumers, who expend price premiums for prestigious brands, a likely goal, as clarified initially, is exclusivity Under the relationship paradigm (Fournier 1998), such consumers elect brands that unambiguously espouse the same goal, the brand's commitment to exclusivity is a necessary condition for an alliance By upsetting a brand's flair to remain exclusive, counterfeits have the potential to unsettle a prestigious brand's relationship with genuine-item consumers at its most vulnerable point the ego significance of the brand (Fournier 1998) These are some of the pretexts for why genuine-item buyers may be disenchanted when the brands they patronize become widely accessible

In summary, previous research has focused on the direct loss of revenue or has examined buyers of counterfeits, shunning interest in the potential loss of utility experienced by genuine-item consumers Yet the protection of intellectual property and trademarks is of scant value to the firm if genuine-item consumers lose interest in the brand that is widely counterfeited The genuine-item consumer is an important, underresearched segment and thus is the focus of this research The following sections first discuss the study's method and then isolate three dominant strategies that genuine-item consumers adopt in the face of a rise in counterfeiting Finally, an integrative discussion outlines the relevance of the findings

Method

Forty in-depth interviews with genuine-item consumers were conducted for this study, 20 each in Thailand and India Asia is witnessing a spectacular rise in prosperity and a scurry among luxury fashion brands to enter or expand in these markets For example, India stands second only to Singapore in the rise of its number of millionaires (Capgemini & Merrill Lynch 2006) Brands such as Brioni, Chanel, Escada, Fendi, Louis Vuitton, Valentino, and Versace have all recently entered the Indian market, and others are reported to be actively considering such a move

At the same time, fashion brands encounter some of their worst abuse in Asia (Ibison 2006) Both India and

Thailand have long histories of trafficking in counterfeits across multiple product categories, such as pharmaceuticals, clothing, and even unauthorized reproductions of the Ferrari P4 (found in Thailand) India and Thailand also were deemed to be suitable sites for this research because of the large proportion of premium-brand consumers who speak English

In-depth interviews were conducted in the cities of Bangkok (in Thailand) and Mumbai/Bombay and Hyderabad (in India) Respondents were recruited for an in-depth interview when they reported a purchase in the last six months of at least one brand for which counterfeits were available locally and when prima facie evidence (price paid) was available that the genuine item had been purchased Respondents were between the ages of 21 and 61, and approximately half were women (Table 1) Interviews were conducted in shopping malls, homes, coffee shops, and private social events All interviews were conducted in English, with occasional support from a translator in Thailand Interviews lasted between 40 and 90 minutes

The overarching goal of the interviews was to discuss thoughts, feelings, and behaviors associated with a rise in the counterfeiting of brands the respondents currently patronized With the aid of a detailed interview protocol document, the interviews covered three complementary themes (1) general knowledge of and opinions about fashions and fashion brands, including past purchases, (2) awareness of protocols and incidence of counterfeiting locally, and (3) opinions about and reactions to consumers who purchase counterfeits

An initial reading of the transcripts and field notes revealed that the dominant reactions to counterfeit proliferation could be sorted into three pools One group of respondents was clearly more agitated than the others and appeared to have the most at stake when counterfeits become abundant Members of a second group steered the interview toward a discussion of their pioneering patronage of some brands and the subsequent loss of exclusivity A third group emphasized how to tell themselves apart from counterfeit buyers Because of such clear clustering of the respondents into three groups, subsequent stages of analysis used this tripartite classification as a dominant framework

In the second stage of the analysis, interviews in each group were analyzed to identify dominant models of response to counterfeits, the goal was to characterize and dimensionalize the key themes in such models (for a discussion of the procedures used in this stage, see Spiggle 1994, Strauss and Corbin 1990) In the final stage, the findings from each group were compared with and contrasted against findings from the other two The goals at this stage were to identify the key dimensions on which the groups differed and to identify the bases for such differences

Findings

In the face of proliferating counterfeits, respondents appeared to adopt one of three strategies (1) flight (abandoning a brand), (2) reclamation (elaborating on pioneering patronage of a brand), and (3) abranding (disguising all brand cues) Next, each strategy is discussed, followed by an integrative summary and additional interpretation

Flight

Consumers who adopted flight tended to be younger (typically between the ages of 21 and 27) and college educated In many cases, their respective brand affiliations dated back no more than a couple of years Being younger, they did not carry much wealth, but their opulent purchase behaviors and general preference for prestigious brands obscured this, brands and trappings associated with upper classes appeared to be important to them Relationships with such brands appeared to serve an urgent need for brand-based identity construction to overcome marginalization that accompanied their migration across social classes (see Mills 1997) In almost all cases, these consumers appeared to be the first in their families to have arrived at their respective income levels In both India and Thailand, many were employed in areas related to computing, high technology, and sales

When the patronized brands were counterfeited, this group abandoned them in favor of new ones Members of the group did not feel confident that others would readily believe that they were wearing a genuine item rather than a counterfeit They reported finding it difficult to make a positive first impression because others may not believe they had the purchasing power to buy the genuine item An undemanding way to avoid being perceived as consumers of counterfeits was to abandon the brands that were widely counterfeited, thus succumbing to the reverberation of counterfeiting on the signaling potential of brands

Such flight from one brand to another appeared to take place in three stages recognition, projection, and separation (see Figure 1) Consumers first became aware of disapproval in the recognition stage and then became uneasy about the challenge in coming across as bona fide patrons of the genuine article Comfort with newly acquired purchasing power appeared to determine the extent to which they experienced such unease When these young consumers began drawing high salaries associated with high-tech jobs in India and Thailand, some became unsure whether they were comporting in accordance with such income levels

> Computer programmers earn a lot of money now It is even better now, that is why everyone wants to get into computer science We are rich after the first salary But some people don't always know how—I mean like how to do things, like how to dress or what clothes to wear I buy what I like, but when I wear it I realize that maybe that is not what I should have purchased [laughs] Sometimes, it looks like some of these people are buying clothes from the shops in Ameerpet [shopping area where counterfeits are easy to find] because they are too gaudy and look cheap, like, I mean everyone has those kinds of clothes All stores have the same clothes (styles) in Ameerpet (Respondent 2, Indian man, age 25)

Respondents blamed proactive others for directly or subtly making such disapproval known This was true in both countries, and women reported more instances of such disapproval than men The difference observed between the sexes may be an artifact of social desirability, such that it is

TABLE 1
Respondent Profile

Number	Country	Sex	Age	Response to Counterfeits	Profile
1	Thailand	Male	24	Flight	Migrated to Bangkok from northern Thailand Currently promotes new electronic products at department stores and special events
2	India	Male	25	Flight	Computer programmer Moved to Hyderabad first to attend college and secured his first job with a business process outsourcing unit
3	Thailand	Female	24	Flight	Grew up in Bangkok and currently works at a bank as a customer service manager
4	India	Female	25	Flight	Computer programmer This was her first job, she started on this job at a large Indian technology company six months ago
5	Thailand	Female	31	Flight	Migrated to Bangkok from northern Thailand at 25 Currently a salesperson at a craft store
6	Thailand	Male	24	Flight	Worked many part-time jobs since graduation three years ago Currently unemployed and considering enrolling in a technical college
7	India	Male	27	Flight	Computer programmer since the age of 22 No significant lifestyle changes until about two years ago, when he started updating wardrobe and venturing out to pubs on weekends
8	India	Female	23	Flight	Travel and ticketing associate with a major European airline
9	Thailand	Female	26	Flight	Security agent with a private event security contractor
10	Thailand	Male	50	Reclamation	Banker Married with three children Worked in various capacities at the same Thai bank for almost 30 years
11	Thailand	Male	52	Reclamation	Bangkok native Currently a senior sales manager at a Benz dealership Married with two children
12	India	Female	56	Reclamation	Holds senior management position at family business Employed there for almost 25 years Divorced
13	India	Female	45	Reclamation	Social worker with a national nongovernmental organization Married to a civil servant
14	Thailand	Male	47	Reclamation	Voluntarily retired early from public service Currently owns five cabs and leases them out Although the same drivers have been leasing them for extended periods, lease payments are received on a daily basis
15	Thailand	Female	40	Reclamation	Married to a civil servant Migrated after marriage from southern Thailand 20 years ago Never employed Mother of two children
16	Thailand	Female	38	Reclamation	Floorwalker at an upscale department store in the children's department Migrated from northern Thailand five years ago Never married
17	India	Male	48	Reclamation	Admissions director at a business school Travels abroad once a year, mostly to the United Kingdom and the United States
18	India	Female	43	Reclamation	Event planner at a leading hotel for 12 years
19	India	Female	49	Reclamation	Accountant at a manufacturing firm Travels frequently across South Asia for procurement

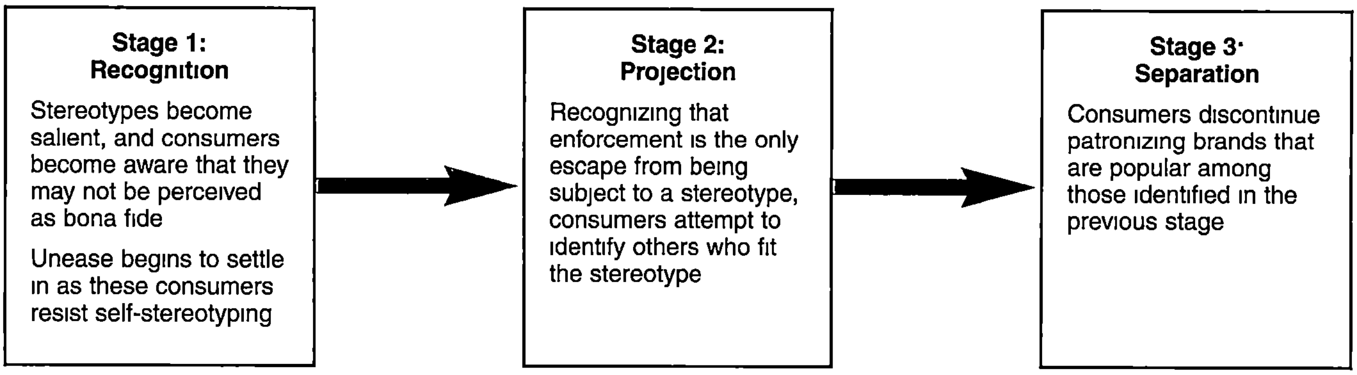
TABLE 1
Continued

Number	Country	Sex	Age	Response to Counterfeits	Profile
20	India	Male	40	Reclamation	Sales manager with a residential real estate developer Previously self-employed
21	India	Male	50	Reclamation	Office manager at a private engineering college
22	India	Female	27	Abranding	Public relations manager with leading magazine that covers Bollywood Educated in the United Kingdom, Never married
23	India	Male	40	Abranding	Chief executive officer of a software company Spends time equally in the United States and India Married with two children
24	Thailand	Male	45	Abranding	Employed in family business in various capacities but has no particular job designation
25	Thailand	Male	61	Abranding	Owner of a commercial real estate company that invests in prime properties Married with one child
26	India	Male	47	Abranding	Head of family's manufacturing business Travels abroad several times a year on work and vacation
27	Thailand	Male	35	Abranding	Head of marketing in his family business Key responsibilities include liaising with advertising agencies and hosting visiting foreign associates
28	Thailand	Female	55	Abranding	Married to a businessman Never employed Comes from a family of business owners
29	Thailand	Male	51	Abranding	Politician
30	India	Male	40	Abranding	Independent graphic artist Married and no children
31	India	Female	21	Abranding	College student
32	India	Female	24	Abranding	Worked in family business until recently Currently not employed
33	Thailand	Male	35	Abranding	Consultant at an American financial consultancy Travels abroad once a year mostly for pleasure
34	India	Female	40	Indifference	Client service manager at an advertising agency Widowed
35	Thailand	Male	30	Indifference	Concierge at a full-service apartment building
36	India	Male	39	Indifference	Senior executive at software consulting firm Travels abroad several times a year
37	Thailand	Female	23	Indifference	Waitress at an upscale restaurant Bangkok native
38	India	Male	55	Indifference	Administrative assistant to a senior media executive at a leading advertising agency
39	Thailand	Male	40	Indifference	Artist and owner of boutique that sells handcrafted handbags and laptop sleeves
40	Thailand	Female	27	Indifference	Statistician at National Statistical Office

more acceptable for women to acknowledge succumbing to such pressures (see Feingold 1994) Another explanation may be that women are also better equipped to decode such disapproval (McClure 2000)

As is evident in the following quotation, the response to disapproval began with a ruffled interpretation that perhaps the consumer was not entitled to brands that were in vogue among the more affluent consumers

FIGURE 1
Three Stages of Flight



Stage 1: Recognition

Stereotypes become salient, and consumers become aware that they may not be perceived as bona fide

Unease begins to settle in as these consumers resist self-stereotyping

Stage 2: Projection

Recognizing that enforcement is the only escape from being subject to a stereotype, consumers attempt to identify others who fit the stereotype

Stage 3: Separation

Consumers discontinue patronizing brands that are popular among those identified in the previous stage

> Sometimes I see these other girls give me those looks in the store If I don't notice them, it is one thing, but if I notice them, sometimes I am hurt, you know, it spoils my day I think of it all day, you don't enjoy shopping As if they are wondering, "How come you are able to dress like me?" Some people don't want others to buy the same clothes they do, then what is the difference? It is not even like they are pretty They have a lot of money They can't believe I go shopping in the same store they go to (Respondent 4, Indian woman, age 25)

In a class-conscious society, such as India, trappings serve as markers of distinction among classes Many consumers engaging in flight appeared to be new migrants of social class, trading brands and other signals associated with one class for those associated with another As employment opportunities and education increasingly enable previously underprivileged classes to migrate across class boundaries, stereotypes appear to be placing such migrants on the defense This phenomenon is consistent with the notion that stereotypes are often used effectively to enforce prejudice (Allport 1954, Simpson and Yinger 1965) Rather than respond to or challenge such stereotypes, consumers engaging in flight appeared to endorse the inalienable nature of such socioeconomic stereotypes Ironically, their only escape from the stereotype appears to be an active endorsement of it In other words, the way to escape a stereotype is by finding other cases that fit it—as if enforcing prejudice liberates a person from being subject to it Thus, those engaging in flight embraced the clarity of stereotypes (Lippmann 1922) by exerting prejudice themselves, leading to projection, the second stage of the flight strategy

> Now look at her She is a real *&#! You can tell that her tee is fake Those shoes, you get them for 20 baht She might think others are stupid not to notice, but when I see a real item, I can tell which is a fake I will tell that she will need much, much more money before she can get the real thing (Respondent 3, Thai woman, age 24)

> [Pointing at another shopper in the mall] If you go close, you can see [that the bead work on the jeans is not very good] That is one way to tell a cheap imitation I can guess that she rode a bus and does not have a car There are so many differences [between the two of us] (Respondent 4, Indian woman, age 25)

> I have worked and paid my rent and everything since I was younger than 20 I don't have a lot of money to throw away, but I can take care of myself I went to visit my parents last week, and I did not get paid [while away], but I can afford that I don't buy many clothes, but whatever I buy, I buy thoughtfully No fakes, but there are the other types too There is this girl I work with, J______, you may have seen her when you first came in She is the tall one She is always wearing new clothes, and I know, I can tell they are fake, she cannot earn so much to wear new clothes every day [laughs] Who can? (Respondent 5, Thai woman, age 31)

As is evident in these quotations, after sensing an apparent enforcement of stereotypes, the interviewees' responses were not a rejection of the stereotype but a statement that it was others, not them, who fit it Such a response of the stereotype implies that it is as much generated internally as enforced externally As Lippmann (1922, p 90) suggests,

> [Preconceptions] mark out certain objects as familiar or strange, emphasizing the difference, so that the slightly familiar is seen as very familiar, and the somewhat strange as sharply alien They are aroused by small signs, which may vary from a true index to a vague analogy Aroused, they flood fresh vision with older images, and project into the world what has been resurrected in memory

It may be on account of such endogenous locus that consumers engaged in flight found it preferable to alter their brand preferences than to fight the stereotype This decision was made in the final flight stage, separation Here, consumers distanced themselves from others they regarded as fitting the stereotype and the brands that were widely counterfeited Such behavior bears remarkable similarity to behaviors associated with social mobility, particularly in class-based societies such as India, in which embracing the aspiration group's customs, rites, and beliefs in place of preexisting ones was a necessary component of "Sanskritization" (Srinivas 1952, p 30, see also Srinivas 1956) In other words, consumers engaged in flight recognized the stereotypes they were being fit into and deliberately distanced themselves from the brands associated with those stereotypes For example, at the time of the study, Diesel was a popular brand in Thailand and also widely counterfeited Consequently, consumers using the flight strategy actively avoided Diesel products to eliminate any doubt about whether they were wearing a genuine item or a counterfeit As two of the interviewees said

> Go to Paragon [a local shopping area] on Friday evening, and you will see Diesel everywhere Most of them are fakes because I know these [kinds of] people [and] where they buy from, just across the street I never do such stuff, because [when] you are going out with your girl, it is not cool to do that So I don't wear Diesel, because you cannot tell who is real and who is fake (Respondent 6, Thai man, age 24)

> There are some [brands] that are more [counterfeited] than others Lee? Most are not original Even Levi's you have to be careful So if I wear Lee jeans, then the petrol pump attendant is also wearing the same So why bother spending so much money? (Respondent 7, Indian man, age 27)

In summary, the young and the newly affluent consumers at a socioeconomic cusp experienced substantial pressure to flee the brands they otherwise would have patronized The reason for this was the unease that their purchasing power, and therefore ownership of the genuine item, would be second-guessed because of prejudices enforced through stereotypes Subsequently, these consumers fled the stereotype through a dual process of enforcing it on other consumers and simultaneously disowning widely counterfeited brands

Reclamation

A second strategy common among buyers of genuine items was reclamation offering at every opportunity ego enhancing and elaborate descriptions of pioneering brand patronage The underlying theme across interviews with such consumers (hereinafter termed "reclaimers") was that they are subject to the externalities of choices that others have made The rise of a brand's popularity was inversely related to its potential to grant reclaimers favorable interpersonal comparison Consumers pursuing this strategy tended to be older and principally unsettled by the loss of exclusive ownership of brand territory Yet reclaimers were unwilling to terminate their current brand choices A reason for this may be that investments in the brand have been made over many years, unlike in the case of those engaged in flight, for whom brand affiliations were more recent

When faced with counterfeiting, reclaimers sense a slight and thus invest their efforts into showcasing their erstwhile exclusive and privileged relationship with the brand Because the incidence of counterfeiting closely follows a brand's popularity, counterfeiting accentuates reclaimers' loss of peerless patronage of a brand because now they must share the stage not only with the mass market but also with those buying counterfeits

> You may think of me as mean, but it is not about being mean I am bringing this up only because you ask I feel offended Does that make me mean? I don't know, you have to decide, you are the professor But since you are asking me, I can tell you I don't like [the rampant counterfeiting] very much I have so many Polo shirts I like them so, all my shirts at one time all my shirts were Polo They are very comfortable, very high quality Then there was a big craze, everyone was wearing Polo There was a time—oh, maybe five or ten years ago—when every store in the garment market sold Polo What is the value of that to me? At one time, I was the only one—or maybe there were two of us—who wore Polo Everyone looked up to us, you know, I mean as being very stylish, well dressed I even met my wife that way She used to say that she noticed me for my Polo shirts [laughs] But now, you enter the (office) building, and there are a hundred people wearing Polo I am not exaggerating It is true (Respondent 10, Thai man, age 50)

Although this reclaimer begins his response only as a statement of his dissent, he proceeds to state particulars of his fashion distinction It is evident that his narration took this course because he felt relegated to a large denominator by the mass market, particularly by people buying counterfeits This effect of a loss of exclusivity is consistent with Hellofs and Jacobson's (1999) observation of the impact of a rise in market share of exclusive goods It suggests that market share can send different signals to current and prospective consumers, the latter may infer it as a testament to good quality, whereas the former may infer it as a loss of exclusivity Note that though many reclaimers labeled themselves as fashion and brand pioneers, they were not the typical fashion opinion leaders or change agents (Sproles 1981, Summers 1970) who frequently adopt new brands Reclaimers were merely the early adopters of their respective brands, they never changed after that Perhaps their anguish against counterfeits was rooted in the disbelief that they remained passive spectators as their hitherto exclusive relationships with brands were transgressed

When asked about recent purchases, reclaimers often detailed how they are making the right choice to patronize, the genuine item Akin to appending consonant cognitions when contested with dissonance (Festinger 1957), these consumers appeared eager to recast the variance between themselves and distant others by highlighting a moral imperative that guided the choice between honesty and deception Reclaimers contemplated their purchase decisions on a moral high ground

> [Purchasing a counterfeit item] is like, what do you call that? Fake breasts You know what I am talking about? They put those bags there They are not real breasts I am sure you know because it is very popular in America It is also becoming popular in Thailand Now, people from America come here to get fake breasts because it is cheaper in Thailand You find a girl in America with fake breasts, and you go out with her Unless people look closely, they cannot tell Everyone looks at your girl, and they are saying "narakjang" ["You are pretty/sexy"] How does that make you feel? You are cheating You are cheating them because you know that [the breasts] are not real Those people who buy fakes are the same way, cheating others and cheating themselves I am foolish not to buy fakes, because it would save me a lot of money, but I don't buy fakes, because I don't go out with women who have fake breasts (Respondent 11, Thai man, age 52)

These two themes—a history of purchasing the genuine item and a clear exercise of choice in favor of it—were dominant among many reclaimers Perhaps because women experienced a lower level of dissonance or possibly because they were downplaying assertiveness (Eagly 1995, Feingold 1994), in general they were subtler about how they emphasized these two themes

> You are really making a moral choice, more than anything else Maybe moral is not the right word Let's say, something very personal It says something about you—who you are inside Should we steal if we know we will not get caught? I am not trying to preach to you What I am trying to say is that [counterfeiting] is wrong, and we should not encourage [the counterfeiters] Fortunately, I am well to do, and I do not have to consider the price of an item, but I know it is a big deal for some people Price is a big deal They are always looking for a sale or discount A fake item is like a discount, because this top I am wearing, I paid over 4,000 rupees, but you can get it on Fashion Street for 400 It is amazing, that you will not be able to tell the difference if you stand there (about 20 feet away) Then, what is the difference between the woman who shops on Fashion Street and me? Is it just money? How wealthy we are? I don't think so There are some really good outfits for that money, which are made by honest workers and even I would buy, but she wants only that top which looks like the 4,000 one But you don't have 4,000! You see the mismatch? So what does it come down to? It simply means that she, she wants that top at any cost We all make choices But the point is, what choices are we making? What are the moral consequences? (Respondent 12, Indian woman, age 56)

> To be honest with you, I don't care Does it really affect me at all? Who cares what some other people are doing? In the circles I move in, it does not cross anyone's mind that maybe I or someone else in our circles is buying such stuff But sure, it does matter in a larger sense In the sense that, let me put it this way Imagine I am walking down the street, and someone else walks by, and she is wearing the same dress, only that she paid next to nothing for that knockoff I don't think it affects me, but I think it affects her She might be thinking that she is the same, let's say, fashion equivalent, or she may even think that I am also wearing one of those knockoffs [laughs] So, yeah, it does affect her in a good way, but I don't think it affects me Except in the sense that only I know my story, she does not Like how you feel when your voice is not heard? You know what I mean? (Respondent 13, Indian woman, age 45)

This dimension—that the voice is not being heard—appeared to be at the core of reclaimers' responses to the proliferation of counterfeits Among these respondents in both India and Thailand, there was a disappointment that there may be no due segregation between these pioneering champions of the genuine item and other consumers This tendency to express disappointment and yet contend with new migrants to the brand (rather than switching brands) implies that reclaimers may be as unhappy with the limits of their own opportunities to switch brands as they are with consumers of counterfeits As mentioned previously, many reclaimers were older and thus were overseeing responsibilities that extended beyond discretionary personal expenditure Wardrobe change was less likely to be an option for many of them as they juggled with other priorities

> Sometimes, like on a holiday or something, I give [the day] off to my driver, and I drive the cab myself Why not? There are still passengers, even on holidays That is when I have a problem Because I am driving, they think I am the driver No one thinks I am the owner So even if you wear nice clothes, no one will believe they are from a nice store They think like, drivers do not have a lot of money, so maybe I purchased in small shops or MBK [large garment market where it is easy to find counterfeits] I don't like that So I tell them that I am the owner, and I am driving because I gave a holiday to my driver Some people don't believe it because they think rich people should not drive a taxi (Respondent 14, Thai man, age 47)

In summary, reclaimers were typically older, more affluent, and carried a longer history of respective brand affiliations than those likely to engage in flight Yet even these consumers appeared to become defensive in the face of counterfeits The main concern for reclaimers was the potential loss of exclusivity and absence of recognition as early patrons of popular brands

Abranding

The third and final observed strategy, common among the most affluent in our sample, was to conceal consumption habits from the lay gaze of distant others Underlying this behavior was a rampant desire to perpetuate social distance by restricting the knowledge others had about these consumers (Simmel 1950) Consumers in this group did not recognize a distinction between those buying counterfeits and any other consumer who wants to emulate the rich Affluent consumers—uneasy with the idea that previously disenfranchised consumers wanted to emulate them—appeared to gravitate preemptively toward brands that lower-income consumers find difficult to detect This tendency is referred to as "abranding," or a state of consumption in which the brand may carry high personal meaning, but neither its identity nor the meaning is readily accessible to a distant observer Such behavior, more than others reported in this article, demonstrates the preservation of exclusivity at the heart of competitive consumption and patronage of premium brands The affluent consumers in the sample valued exclusivity and reported hostility toward those trying to threaten it

> There is always this need to be distinctive—let's say, like someone others notice and admire It is not something you do consciously, but it happens to everyone But it just happens that everyone in circles where I move [are] fashionable in a very individual way—you know, their own special touches So naturally, I don't want to dress like the masses, because then it means that I do not have that individual flair So I almost have to be a bit protective, you know, about what I wear and how I wear it You watch everyone, but you don't show anyone anything The worst thing that can happen is for you to dress up and arrive at a party looking like a regular person—you know, like those guys in Tommy Hilfiger shirts! [laughs] (Respondent 22, Indian woman, age 27)

Disdain for imitators was common among abranders, particularly in suggesting that lay consumers are downright unaware of their consumption behaviors Abranders invoked three important themes (1) The main distinction between them and others is the extent to which brand patronage is (in)conspicuous, (2) an absence of overt exhibition of brand patronage is a step in the right direction, and (3) there is a need to hide brand affiliations, lest others embrace them as well Perhaps on account of relatively greater fluency with the English language, in general, respondents in India were more critical than those in Thailand

> You can imitate all you want, but what are you going to imitate? You don't even know what I'm wearing Some people like to flaunt, always making sure that everyone knows that they are wearing X and Y names But those poor people do not realize that now everyone wearing X and Y is the same Is that what they wanted in the first place? I don't think so I don't even shop in India I do most of my shopping in Europe and the U S It will be a while before these guys even learn to pronounce the brand names correctly! (Respondent 23, Indian man, age 40)

> It is easy to tell the difference between people at my level and others The easy way is to see what we are wearing Do you see any nametags (brand insignia) here? But you go there (on the streets) and look at the so-called trendy, and you will notice that they all have nametags They are trying to be like each other, but not like me, because there is no nametag (on my clothes) So how do you start to be like me if you don't know me? The difference is that they are trying to be like each other, but I am not (Respondent 24, Thai man, age 45)

As previously mentioned, respondents in this group also believed that an absence of visible brand affiliations is a step in the right direction They regarded the tendency to flaunt brand names and the corresponding imagery as a sign of inadequate fashion sense and a lack of confidence Although such a value judgment had little to do with preventing others from emulating, respondents were reassured that it would serve a more direct purpose of signaling their own status

> In my business I meet top people—CEOs and presidents You can look around here and see the people who are here These are my friends People like this There are customs on how one must present oneself If my wife wears Prada sunglasses, then it does not give a good impression, as if we want to show how much wealth we have You have to be quiet about those things They know I have a lot of money Otherwise I would not be where I am And we only buy good stuff They know that What is needed, then? There is no need to show that, because they know already They buy the same things as we do (Respondent 25, Thai man, age 61)

Although this quotation does not necessarily convey the relevance of distance from other consumers, further probing revealed that this consumer was indeed concerned about it

> Who is the person who wants to show how well-to-do he is? Who is he? The one who is not well-to-do, or someone who is young and not confident When you really have a lot of money, you don't show it It is there My son is wearing an Armani suit today He is over there I complimented him earlier on his suit, and he said it was Armani I did not know it was Armani You just look at the quality, it also happens to be a famous name because famous names have high quality If it was obvious what suit he was wearing, then in my mind he is not wealthy He is like a commoner, because they don't have money to buy real high quality, so they buy only the high-quality names they see around them Then they try to show that they are wearing the same name as others Without the name, there is nothing When I buy based only on top quality and don't care at all whether you see the name of my suit, then you see why people here are different from the others you find outside this room (Respondent 25, Thai man, age 61)

Such distaste for brand displays was common in this segment Unlike a probable tendency among consumers of counterfeits to showcase their favorite brands, abranders expressed a zeal for the opposite approach to hide all such affiliations from public gaze This was driven by a predominant instinct to designate substantial social distance from others and nominate an axiomatic eminence Any contest by others was reckoned futile The following two men, one in India and one in Thailand, summarized the essence of such a strategy

> When you are rich, you have everything You can get anything you want Then, what is it that you want the most? Can you guess? [long pause] I can tell you Every rich guy wants just one thing He does not want others to be like him Like being unattainable He wants to be the only one like him It sounds pompous, but I tell you, when it comes down to it, that is the truth I don't want them wearing the clothes I wear, I don't want them driving the same car I drive, I don't want them in my club But you know what? That will happen When they make loads of money, who doesn't want to? When they make that money, what do you think they want to do? They want to do things that I do It is a game You think I am going to sit here and let them win? Of course not! I will always have to be ten steps ahead (Respondent 26, Indian man, age 47)

> How would I describe myself? [long pause] Mystery man! [Uneasy laughter] Like James Bond All the men want to be like James Bond All the women want to marry James Bond Everyone knows James Bond, but no one really knows him, because he keeps too many secrets People want to be like him, but how to be like James Bond? It is a secret No one knows Do you know where he learns that style? It is a mystery Do you know what suit James Bond is wearing? You want a suit like that, but where do you get it? It is a mystery (Respondent 27, Thai man, age 35)

Although abranders implied that they would benefit from the absence of others who emulate them, they needed these others to be distant from, that is, to maintain social distance, people need distant others from whom to keep away As Veblen (1912, p 36) suggests, to "gain and to hold the esteem of men it is not sufficient merely to possess wealth or power The wealth or power must be put in evidence, for esteem is awarded only on evidence" However, in placing their wealth on display, abranders were unwilling to risk putting forth duplicable proof and tried to focus on the singularity of such proof

Although abranding can occur even in the absence of counterfeiting, it is a significant issue in understanding counterfeiting and competitive consumption A buyer of counterfeits wants an accessible way to affiliate with brands patronized by affluent consumers Abranding reveals that efforts to realize such aspirations will be actively muddled

> The good designers don't announce their names the way others do The department store brands do that, not the designer ones Even if I wear a very attractive [department

> store] dress, I am equal to another person wearing the same company's clothes, even if her dress is not as attractive The name of the company makes us equal But if you don't know what company clothes I am wearing, then you have to only look at whether my dress is attractive or whether her dress is attractive And my dress will be attractive because this is from a famous name designer And you don't know that, unless you ask me [laughs] (Respondent 28, Thai woman, age 55)

In summary, the most affluent consumers in this study reported relative immunity from competitive consumption championed by counterfeiting because of the apparent privacy surrounding their brand relationships Yet such privacy did not appear to be a natural extension of their respective brand affiliations but rather an outcome of orchestrated abranding

Summary of Strategies

As counterfeits expand the number of consumers who can now gain access to a brand, that brand loses much of its potency as a signal of exclusivity When that happens, consumers seeking exclusivity will adopt one of the three strategies flight, reclamation, or abranding (see Table 2) Consumers engaged in flight are fleeing from the possibility of being mistaken as consumers of counterfeits, reclaimers are dislodging dissonance by typecasting the new patrons of the brand as lacking scruples, and abranders want to sustain social distance by muddling comparison and emulation

The three core strategies and the underlying reasons for them have relevance beyond responses to counterfeits As the next section elaborates, brands are as important to consumers as they are to marketers The dynamics discussed in the preceding sections reveal the competitive relationships that consumers have with one another and the use of brands as tools, a topic that the following section also explores further Finally, some respondents expressed relative indifference to counterfeiting of the brands they currently patronized Although it was not possible to explore all the reasons for such indifference, one factor that was consistent across many of these consumers was their relative indifference to brands in general and an acknowledgment that they have switched brands many times in the past

Discussion

This research concludes that genuine-item consumers are not indifferent to the proliferation of counterfeits In the past, a focus on aggregate sales, an investigation of the playful component of purchasing counterfeits, and an interest in the purchase of counterfeit accessories have led to the conclusion that "counterfeits may not devalue the sense of ownership of luxury goods" (Nia and Zaichkowsky 2000, p 495) The current research expands this focus and draws attention to the competition between genuine-item consumers and those of counterfeits

TABLE 2
Summary of Responses to Proliferation of Counterfeiting

	Flight	Reclamation	Abranding
Key response to proliferation of counterfeits	Flee brands popularly counterfeited	Offer evidence of pioneering brand affiliations and (self-declared) fashion leadership	Disguise information on brands patronized
Motivation behind key response	Fear of conforming to stereotypes	Dissonance arising out of two factors (1) others not similarly stationed are dressing as these consumers do, and (2) the inability to change wardrobe on account of substantial investments already made and lower discretionary incomes	Desire to sustain high social distance from others not similarly stationed
Profile	Young Newly rich Transitioning social classes Mean age 25 years	Older Well-established brand loyalties Mean age 47 years	Very affluent Mean age 40 years
Brands patronized	Pepe Diesel Dolce & Gabbana Gucci Nike Armani Exchange	Ralph Lauren Coach Tommy Hilfiger DKNY Fendi	Giorgio Armani Versace Hermes Anderson & Sheppard Escada
Topic that engaged them the most	When you see counterfeits, how does that make you feel?	Tell us about your last purchase of a fashion item	How will I be able to tell the difference between you and someone wearing a counterfeit?

Implications for Theory

By drawing attention to the externalities of brand relationships, the findings herein extend the understanding of consumer–brand relationships and suggest that compatibility between a consumer and a brand is contingent on which other consumers relish such compatibility. Accordingly, pride, possessiveness, and envy should be included in considerations of consumer–brand relationships because such relationships are not operating as secluded dyads but rather as part of a sociocultural system of heterogeneous, elective brand relationships of many consumers. As with other cultural categories that have turned elective (McCracken 1986), wider access to fashions—engineered out of wider access to economic capital—to which only the wealthy were once privy has resulted in a devaluation of that capital to its original owners (Bourdieu [1979] 1984, Davis 1992). Such effects are commonly accounted for by the trickle-down thesis, pioneered by Simmel ([1904]1957) and Veblen (1912), that "once adopted by the upper-class, fashions are imitated by each succeeding lower class until they have 'trickled down' to the lowest class" (Sproles 1981, p. 119). However, this explanation does not thoroughly account for the competitive trading in brand capital observed in the current research, in which reclaimers and abranders, for example, were hostile to this process and attempted to choke it. This is an important finding because it implies that in constructing consumption identities through perceived contrast to others (Thompson and Haytko 1997), consumers do not hesitate to demand possessive, exclusive relationships with brands to be able to manage the complex process of showcasing their distinction among consumers while concealing the thrust of such distinction.

Consumers across all the three strategies—flight, reclamation, and abranding—are managing brand affiliations to impose order when challenged by migrants of social class. This finding lends broader support to the argument that fashion enables consumers to promote order—an idea consistent with the "traditions" of modernity (Berman 1988, p. 18)—rather than escape into a "disjointed and noncommittal stance" (Thompson and Haytko 1997, p. 35). Furthermore, the nature of brand affiliations reported here suggests that though marketers benefit from broad brand appeal, such appeal is predicated on qualified access to the brand, to the extent that some consumers pine for near-exclusive relationships with their brands and actively abhor broader access to them. This is a zero-sum competitive relationship among consumers that is seldom examined in research. Although the current research has specifically examined counterfeits, it rests on the broader theses of exclusivity and privilege, making these findings widely relevant.

Implications for Brand Management

The findings carry various implications for brand managers. Primarily, the variance in responses to counterfeits noted in this research suggests a necessity to consider response to counterfeits in defining target markets, in identifying the relationships of those targets with the brand, and in crafting brand strategy. If a consideration of consumers' potential response to counterfeits is absent from brand strategy, the brand risks turning into a malleable gadget that is used without tact when there is a sociocultural duel between genuine-item consumers and those of counterfeits. Note that genuine-item consumers did not express sympathy for a brand when it was extensively counterfeited. For a brand's voice to rise above the shrill of historically prevalent and culturally rooted stereotypes that are invoked in a fight against erosion of exclusivity, the brand must be proactive in reinforcing its relationship with genuine-item consumers, and this is better accomplished when potential response to counterfeits is integral to how such customers are segmented and targeted. Therefore, it appears imperative for a brand to consider its customers' likely responses to counterfeits through its entire relationship with those customers.

The findings also lend support for programmatic multibranding aimed at retaining consumers who otherwise would have fled the brand when faced with widespread access to it. Akin to the quintuple branding strategy practiced by Armani, entry-level brands at the bottom should embrace faddish themes aimed at younger, fickle buyers in need of reassurance on fashion sense and brand choice. When these consumers are faced with the prospect of flight, as discussed elsewhere, subbrands at higher tiers represent easy destinations. Such an approach will benefit the brand and the consumer. Although the parent brand will benefit from customer retention, customers who flee to a more expensive subbrand because of a step up in status are not likely to experience any dissonance, compared with customers who flee to another brand along the same price point.

In fighting counterfeits, managers have focused on sales lost to purchases of counterfeits that should have been purchases of the genuine item. The current research suggests that such unalloyed counting underestimates the monetary consequences by overlooking the losses that result when genuine-item consumers abandon the brand. Perhaps more vital is that this does not account for the loss of equity with which genuine-item consumers contend. Counterfeits do not merely devalue the brand, they devalue the brand-based meanings and the brand relationships that genuine-item consumers invest in over long periods. The findings of this research suggest that in fighting counterfeits, brand managers must aim to protect and account for customer equity, not merely brand equity.

Implications for Policy

Counterfeits pose an odd challenge to public policy. Marketers are granted trademarks so that they can reap return on intellectual property by electing to exclude, at will, access to their brands and trademarks. Conversely, nonexcludable public goods remain within the purview of public policy. The current findings argue that given this dichotomous view, policy instruments may not be fully equipped to cope with the loss of utility experienced by genuine-item buyers. This is because public policy does not yet recognize the value of the brand to consumers and the equity that consumers associate with it. It is worth debating whether consumers of private goods should also be afforded protections, particularly in the case of rivalrous consumption.

Even a symbolic recognition of the interest of genuine-item consumers may be a valuable beginning Currently, battling threats from counterfeits typically requires a firm either to establish direct or contributory infringement or to prove that a trademark risks losing its ability to serve as a unique identifier The devaluation of the trademark in the minds of genuine-item buyers must also be included in this discussion Otherwise, brands will continue to be singled out for unilateral onus in preventing infringement, and policy will continue to overlook the impact on genuine-item consumers

Direction for Further Research

The implications addressed here are better understood when this research is extended to draw particular attention to these and other related issues Such extensions may include a calibration of brand equity when faced with a rise in counterfeiting At what point do some consumers begin to flee a brand? When does the brand become sufficiently counterfeited that a sizable group of consumers becomes uneasy about being seen with it? What early indicators signal an impending defection?

Counterfeiting of global brands receives the bulk of research attention, and there is a dearth of research on the impact of counterfeiting of popular domestic brands With the rising profile of local and regional brands, it would be fruitful to compare the responses to counterfeiting of global and domestic brands Along the same lines, further research should also investigate responses to counterfeits across markets The higher quality of fakes and the rise of affluence in South Korea and China make these two countries fertile grounds for such research Further research should also explore and identify the credentials a brand manager can offer to the reclaimer At a macro level, further research could investigate whether computations of the cost of counterfeits should include the cost that genuine-item consumers incur as they lose the value of their purchases as signals

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Ram Bezawada, S. Balachander, P.K. Kannan, & Venkatesh Shankar

Cross-Category Effects of Aisle and Display Placements: A Spatial Modeling Approach and Insights

Amid growing competition, retailers are increasingly interested in more effective aisle and display management strategies These strategies involve placements of product categories in aisles and displays within each store to facilitate greater sales affinity (demand attraction) between categories to improve the store's share of customer wallet The authors investigate the effects of aisle and display placements on the sales affinities between categories They develop a spatial model of brand sales that allows for asymmetric store-specific affinity effects between two or more categories, while controlling for the effects of traditional merchandising and marketing-mix variables, such as price, feature, and display They estimate the model on aggregate store-level data for regular cola and regular potato chip categories for a major retail chain, using hierarchical Bayesian methods They show the usefulness and extension potential of the model through simulation of aisle placements for a third category The results show that aisle and display placements have significant and sizable asymmetric effects on cross-category sales affinities comparable to those influenced by marketing-mix variables Retail managers can use this detailed store-level model and subsequent insights to develop customized aisle and display management for their individual stores

Keywords cross-category sales, aisle management, display placement, spatial model, marketing mix

Retailers today face increasing competition in their markets, prompting them to focus on in-store merchandising (e g , aisle and display placement decisions) and promotion (e g , price and deal decisions) strategies to improve their shares of consumer purchases and wallets (Bolton, Shankar, and Montoya 2007, Kumar, Shah, and Venkatesan 2006) As much as 70% of consumer decisions for grocery products are made at the store, making these in-store merchandising decisions critical to retailers' performance (Aldata Solution 2007) To this end, retailers are going beyond category management to cross-category management initiatives involving merchandising and promotion (Basuroy, Mantrala, and Walters 2002, McTaggart 2005) Whereas the goal of category management is to maximize profits across brands within a product category, the objective of cross-category management is to optimize profits across categories

At the heart of cross-category management lies a deep understanding of a cross-category sales affinity (demand attraction between categories) analysis that helps retailers identify the product categories that are likely to be purchased together (*Supermarket Business* 1999) More formally, the sales affinity of a focal product category to a second product category can be defined as the tendency for sales in the second product category to influence sales in the focal category The observed sales affinity between any two product categories at a store may be due to (1) the aisle placement, (2) the location of displays, (3) marketing-mix decisions (e g , prices, deals), and (4) purely coincident purchases for the two categories The sales affinity due to the first three elements depends on the intrinsic or inherent tendency of the categories to be bought and consumed together in a usage situation or occasion Retailers can use the results of affinity analyses to plan more effective in-store merchandising and promotion strategies to increase their customers' cross-buying of products, leading to greater purchases at their stores

Retailers' embrace of cross-category management initiatives is also changing the way manufacturers market their products To be more responsive to the retailers' emphasis on improving cross-category performance, manufacturers are paying greater attention to cross-category affinities in planning their marketing strategies (Dupre and Gruen 2004) For example, Pepsi and Frito-Lay jointly undertake integrated marketing campaigns together with extensive cross-category merchandising to boost sales and profits in both the soft drink and the snack categories (*The Wall Street Journal* 2003) Similarly, General Mills helps retailers improve merchandising strategies through analysis of purchases across categories (ACNielsen 2005) In addition to helping retailers, such strategies can also benefit the manufacturer by increasing the sales of multiple brands in disparate but related categories The benefits are particularly high if a manufacturer is a category captain (typically a leading vendor of the category) that the retailer selects to plan merchandising and other marketing decisions for that category (Gray 2005)

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An important part of a retailer's cross-category management strategy is aisle management strategy. Aisle management involves the effective placement of categories in the store aisles to improve customers' shopping experience, sales of related categories, and overall store performance (Burke 2005; *Drug Store News* 1998). The relative aisle placement of two categories is typically represented by aisle adjacency, which refers to the proximity of aisles that stock the categories. Retailers can significantly benefit from effective aisle management decisions. For example, according to the director of category management at the SuperValu chain, the retailer used to stock boxed dinners in one aisle and rice mixes two aisles from it (*Progressive Grocer* 2004a). However, moving the products even closer may provide higher visibility for the products and a better shopping experience for the consumers.

Another critical part of retail cross-category management strategy is display placement strategy. The location and proximity of displays of one category with respect to another category can have a significant effect on the sales of both categories. A detailed understanding of such effects can help retailers better manage the placement of displays of different categories in the store.

Although analysis of the effects of aisle and display placements on cross-category sales is important to retailers, it is not an easy task for several reasons. First, these effects need to be estimated in the presence of other marketing-mix variables, such as price and feature advertising, which are important determinants of retail sales (Bolton and Shankar 2003; Kirande and Kumar 1995; Kumar and Leone 1988; Shankar and Bolton 2004; Walters 1991). Second, the analysis method should account for the spatial distances or differences in locations of aisles and displays. Third, the analysis should allow for potential asymmetries in these effects between product categories. Such asymmetry exists when the affinity of Category 1 (e.g., potato chips) to Category 2 (e.g., cola)—in other words, the effect of sales of Category 2 on sales of Category 1—is different from the affinity of Category 2 to Category 1 (i.e., the effect of sales of Category 1 on sales of Category 2). These asymmetries in the effects of aisle and display placements on the sales of two categories can have important implications for retailers. By knowing the categories whose aisle and display placements have strong effects on the sales of other categories, a retailer can choose the locations of aisles and displays for different categories to boost overall store sales.

Thus far, retail stores have adopted a macro approach to aisle and display management, grouping product categories into broad clusters for aisle location based on consumer expectations, shopping habits, store size, and area demographics (Goldschmidt 2007; McTaggart 2005; *Progressive Grocer* 1996). This approach typically focuses on optimal floor space allocations. For example, SuperValu practices a category space optimization approach in which the retailer decides retail floor space for a product category on the basis of its contribution to overall store sales (Tarnowski 2004).

However, such approaches or models have important limitations and are suboptimal. First, these approaches primarily focus on floor space allocation and do not account for spatial proximities between aisles and across display locations. Second, many aisle and display placement decisions are based on managerial judgment that may be suboptimal. A retailer-level model that captures the effects of spatial proximities can potentially enable retailers to improve their aisle and display placement decisions significantly, leading to sizable profit gains. The incremental annual profit from more effective aisle and display placements of two categories, such as cola and chips—typically among the top six categories of a supermarket chain in sales volume—could range from $10 to $15 million for a 200-store retail chain.[1]

In this article, we develop a spatial model to analyze the effects of aisles and display placements on the sales affinity between categories, while controlling for the effects of marketing-mix variables, such as price, feature, and display, on cross-category brand sales. We estimate our model on store-level brand sales data for regular cola and potato chip product categories, using the hierarchical Bayesian method. We show the usefulness and extension potential of the model through simulation of aisle and display placements of a third category. Our empirical analysis reveals important findings. It shows that aisle and display placements have significant and sizable asymmetric effects on cross-category sales affinities, comparable to those influenced by marketing-mix variables.

We believe that this research makes important contributions. First, to our knowledge, this is the first article to analyze empirically the effects of aisle and display placements on cross-category sales, providing important insights into these decisions. In doing so, our work extends prior research (e.g., Bultez and Naert 1988; Corstjens and Doyle 1981; Drèze, Hoch, and Purk 1994) on retail floor space and shelf space management and enables ease of analysis by using readily available store-level scanner data rather than costly in-store experiments that vary aisle placements. Second, this research offers a spatial statistical analysis tool that accounts for the distances across aisle and display locations to study the effects of aisle and display placements on cross-category sales, thus helping retailers improve their performance store by store. Third, we extend spatial modeling applications in marketing that use only a single spatial correlation parameter by allowing for asymmetric effects through the use of two parameters and by employing multiple spatial autoregressive structures to model disparate in-store category affinities. Our analysis incorporates both substitution effects within a category and complementary effects across categories, offering a comprehensive approach to measuring affinity effects.

Conceptual Development

Typically, the demand for two product categories is complementary when they are consumed together. Examples of pairs of complementary categories include toothpaste and toothbrush, cake mix and cake frosting, and detergent and fabric softener. The greater the intrinsic sales affinity between any two categories, the larger are the effects of aisle and display placements and promotional decisions across the two categories Prior research in this realm has used both household-level (market basket) data and store-level data to empirically infer these complementarities through the correlation of preferences across categories In general, studies that use market basket data investigate the problem at the category level, and those that use store-level data examine these effects at the brand level

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[1] This is based on conversations with senior executives of two leading retail companies that operate in the northeastern and southern parts of the United States.

The relative aisle placement of categories in the store can affect the joint purchases of two or more categories Although there is a dearth of studies on aisle placement, the related literature on retail floor space and shelf space management suggests that there could be cross-category affinities due to aisle placement Several studies have developed algorithmic optimization approaches to shelf space allocations while considering cross-category effects (e g , Borin and Farris 1995, Bultez and Naert 1988, Corstjens and Doyle 1981, Curhan 1972, Thurik and Kooiman 1986, Urban 1998) Drèze, Hoch, and Purk (1994) report results from a field experiment about shelf placement, in which juxtaposing a product category, such as fabric softeners, between the shelves of the complementary categories of liquid and powder detergents resulted in a significant increase in the sales of the laundry care category as a whole

Although these studies suggest the importance of floor space and shelf placements for cross-category sales, they do not examine the effects of aisle or display placements Moreover, little is known about the potential asymmetry in the effects of both aisle and display placements across categories that makes the effect of aisle placement of one category on the sales of the other category different from that of the other category For example, the likelihood of a toothpaste purchase evoking the chewing gum category in the consumer's mind and triggering the latter category's purchase may be higher than the converse event Such differences have been attributed to the strength of the associations between categories under the associated network theory of category knowledge structures (Ratneshwar and Shocker 1991) Through its strong link to the oral care category in the consumer's mind, the toothpaste category can evoke a related category, such as chewing gum However, the chewing gum category does not have oral care as its central benefit, because it is both an experience product and a social product that can be shared Consequently, the purchase of chewing gum is less likely to evoke oral care and the toothpaste category to which it is linked in the consumer's associated network [2] Furthermore, because traveling to a different aisle imposes a disutility to consumers, we expect that the affinities in both directions (toothpaste on chewing gum and chewing gum on toothpaste) are attenuated by the distance between the aisles

The implication of the asymmetric affinities between the categories is that if a consumer visits the toothpaste aisle to make a purchase, he or she may decide to look for chewing gum as well If chewing gum is available in an aisle nearby, the consumer may see it and buy it However, the close proximity of chewing gum to toothpaste may not necessarily lead to the consumer buying toothpaste when he or she first visits the aisle containing chewing gum Thus, there are strong theoretical reasons to expect the influence of aisle placements on cross-category affinities to be asymmetric

The placement of displays for a category may also affect sales of another category Displays serve as reminder advertising for a brand, a product category, and other product categories that might be related to that category in a consumer's categorization schema (Sujan and Dekleva 1987) As with aisle placement, display placement of product categories offers a goal-oriented shopper several benefits It reduces information search complexity by making assortment assembly easier, it reduces acquisition efforts, enhancing convenience, it provides in-store cueing of forgotten needs relating to another category, and it facilitates variety seeking and new product choice to meet the goal (Ratneshwar, Pechmann, and Shocker 1996) Our purpose is to investigate such effects using store-level sales data to provide actionable implications for aisle and display placements In addition to aisle and display placements, pricing and deal decisions in one category may affect purchase incidence in related categories

Prior studies have used different models and data to estimate these effects Manchanda, Ansari, and Gupta (1999) develop and estimate a multivariate probit model for purchase incidence decisions across cake mix, cake frosting, fabric detergent, and fabric softener categories, using market basket data In a similar vein, Russell and Peterson (2000) assess cross-category dependence in consumer choice behavior using a multivariate logistic model They estimate their model using market basket data on paper towels, toilet tissues, facial tissues, and paper napkins and find that these categories are characterized by inelastic own demands and mostly negative cross-price elasticities [3] Heilman and Bowman (2002) examine segmentation of consumer purchasing across multiple categories using a logit-mixture model estimated on household purchases of three baby product categories Using store-level data, Song and Chintagunta (2006) model both store choice and brand purchase incidence for four categories analgesics, ready-to-eat cereals, laundry detergents, and toilet tissues They find that cross-category price elasticities are much smaller than own-category price elasticities Moreover, they identify some categories as complements and some as substitutes Wedel and Zhang (2004) estimate within- and cross-category effects of regular and sale prices on brand sales for the refrigerated and frozen orange juice categories Other researchers have investigated correlations in price sensitivity across categories without explicitly examining coincidence of purchases (e g , Ainslie and Rossi 1998, Kopalle, Mela, and Marsh 1999, Russell and Kamakura 1997) [4]

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[2] Similarly, a category commonly bought on a planned purchase or stock-up trip is more likely to trigger a purchase of a product category usually purchased on a fill-in shopping trip than vice versa

[3] This statement implies that these categories are complements

[4] For an extensive review of models pertaining to multicategory choice, see Seetharaman and colleagues (2005)

The effect sizes of aisle and display placements and of marketing-mix variables, such as price, feature, and display, in one category on the sales of another category may be different. Although the effects of such marketing variables on category sales have been shown to be significant (e.g., Kumar and Leone 1988), they may not necessarily be higher than those of aisle and display placements, because these in-store merchandising activities are becoming increasingly influential on sales (Drèze, Hoch, and Purk 1994). There is no strong theoretical rationale on the relative sizes of these effects, so we view them as empirical issues suitable for detailed investigation with appropriate models and data.

Model Development

To examine cross-category effects, we develop a model of cross-category sales using spatial statistics. Marketing researchers have used models based on spatial statistical methodology in other contexts (e.g., Bronnenberg and Mela 2004, Jank and Kannan 2005, 2006, Rust and Donthu 1995, Ter Hofstede, Wedel, and Steenkamp 2002, Yang and Allenby 2003).[5] However, to our knowledge, we are the first to use the spatial statistical methodology to study the effect of aisle and display placements on cross-category sales.

We can write our model as follows:

$$(1)\quad \ln(S_{cjt}) = B + N_j \ln(p_{cjt}) + \Psi d_{cjt} + \Gamma f_{cjt} + \Pi d_{cjt} \times f_{cjt} + \chi Season_{cjt} + \eta Holiday_{cjt} + \theta_{cj} + \phi_{cjt} + \varepsilon_{cjt},$$

where $S_{cjt} = [S_{1cjt}, S_{2cjt}, \ldots]'$ is a stacked vector of brand sales such that S_{icjt} is unit sales of brand i in category c at store j in week t and p_{cjt}, d_{cjt}, and f_{cjt} are vectors of brand prices, displays, and features, respectively, stacked in a way similar to S_{cjt}, where $i = 1, \ldots, I_c$, $c = 1, \ldots, C$, $j = 1, \ldots, J$, and $t = 1, \ldots, T$.[6] Furthermore, Season is a vector of dummy variables capturing seasonality effects, and Holiday is a vector of dummy variables representing holidays, such as Memorial Day and Christmas. In addition, B, N_j, Ψ, Γ, Π, χ, and η represent vectors of coefficients for the corresponding variables, θ_{cj} is a vector of aisle placement–induced cross-category sales affinities (i.e., a function of observed aisle placements), ϕ_{cjt} is a vector of display placement–influenced cross-category sales affinities (i.e., a function of observed display locations), and ε_{cjt} is a vector of residual errors.

We use a double-log functional form for price and a log-linear form for display, feature, and their interaction (i.e., the dependent variable is in log form, but the independent variables are in linear form), consistent with prior studies (e.g., Kumar and Leone 1988, Shankar and Bolton 2004, Van Heerde, Gupta, and Wittink 2003). The double-log form for a variable such as price has the desirable property of the parameter estimate directly providing the elasticity for that variable. We can compare the price elasticities for different brands by directly comparing the parameter estimates. Moreover, the double-log form captures the diminishing-returns-to-scale property for the variable. The log-linear form is appropriate for dummy variables, such as those for display, feature, and their interaction, because these variables take the value of zero for several observations.

For parsimony, we examine two product categories in the model but can include more categories by expanding the number of rows and columns in the weighting matrices (we describe this in greater detail subsequently) in the model to accommodate affinities among multiple categories. Alternatively, we can analyze categories in a pairwise way, as we show subsequently in an extension to this model. In our empirical analysis, we consider two categories that are a priori expected to be complements: regular cola and potato chips; thus, in the rest of the article, we assume that the number of categories is C = 2. Our model incorporates both substitution effects between brands within a category and potential complementary effects across the categories. We present a more detailed specification of Equation 1 and the coefficient matrices in Appendix A.

Aisle Placement–Influenced Cross-Category Sales Affinities

In Equation 1, θ_{cj} is the store-specific cross-category sales affinities for category c and store j that are influenced by aisle placement. Let θ_j denote the vector that comprises θ_{cj} for both categories. We specify θ_j using a spatial autoregressive structure (Smith and LeSage 2004), as follows:

$$(2)\quad \theta_j = \rho\left(\tau_1 W_{1j} + \tau_2 W_{2j}\right)\theta_j + u_j, \text{ and}$$

$$(3)\quad \tau_1 + \tau_2 = 1.$$

In Equation 2, u_j is a stacked vector of nonspatial errors for the two categories at store j. Our specification estimates θ_j at the category level rather than at the brand level because the latter model is difficult to identify with our data. Appendix A provides additional details of the distribution assumptions for u_j. The sales affinity between the categories is captured by the spatial term, $\rho(\tau_1 W_{1j} + \tau_2 W_{2j})\theta_j$. We posit that the sales affinity between two categories depends on the distance between the aisles in which the categories are stocked in the store. Typically, cola and chips are located in different aisles in the store. However, in some stores, the categories face each other or are located on opposite sides of the same aisle. Because sales affinity may be greater in the latter case than in the former, we use separate weighting matrices, W_{1j} and W_{2j}, for store j to capture these two effects (i.e., aisle distances between the categories and whether they are on opposite sides of the same aisle, respectively). We describe W_{1j} and W_{2j} in greater detail in Appendix A. The terms τ_1 and τ_2 are weights (normalized to sum to one) attached to W_{1j} and W_{2j}, respectively, and they capture the relative influence of the two effects in explaining cross-category sales affinity. In Equation 2, we specify W_{1j} and W_{2j} on the basis of store planogram data, but we estimate the other parameters.

The spatial correlation parameter matrix ρ consists of two parameters, ρ_1 and ρ_2, that capture the directional affinities between the two categories, where $\{\rho_1, \rho_2\} \in (-1, 1)$. Thus, ρ_1 measures the affinity of sales in Category 1 to sales in Category 2. In other words, ρ_1 is a measure of the influence of sales in Category 2 on sales in Category 1. Similarly, ρ_2 measures the affinity of sales in Category 2 to sales in Category 1. Because we consider cola and chips complements, we expect both ρ_1 and ρ_2 to be positive. Moreover, because the affinity of cola to chips can be different from that of chips to cola, we allow for two spatial correlation parameters in the form of ρ_1 and ρ_2. As we noted previously, this step is a significant extension of prior research, which has used only a single spatial correlation parameter.[7]

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[5] Other nonmarketing studies that use spatial statistics methodology to study various problems include Gelfand, Kottas, and MacEachern (2005).

[6] In our case, $I_c = 4$, $C = 2$, $J = 79$, and $T = 108$.

Display Placement–Influenced Cross-Category Sales Affinities

The term ϕ_{cjt} in Equation 1 captures the cross-category sales affinity influenced by the distance of display placements (e.g., wing/end-of-aisle displays) from the aisles containing the categories. Because the location of the display placements can vary from week to week within a store, we have the time subscript t for ϕ_{cjt}. As with the aisle placement affinity parameter, θ_{cj}, we estimate ϕ_{cjt} using a spatial autoregressive structure at the category level rather than at the brand level for similar reasons. In addition, we estimate a single spatial correlation parameter (ρ_3) for ϕ_{cjt}. We define ϕ_{jt} to be the vector of the category-level parameters, ϕ_{cjt}. We specify ϕ_{jt} using the following spatial autoregressive structure:

$$\phi_{jt} = \rho_3 W_{3jt}\phi_{jt} + \upsilon_{jt} \tag{4}$$

The spatial error term, $\rho_3 W_{3jt}\phi_{jt}$, in Equation 4 represents the cross-category sales affinities influenced by display placements, where ρ_3 is the spatial correlation parameter that indicates the strength of such affinities, $\rho_3 \in (-1, 1)$. Because we expect the two categories to be complements, we anticipate ρ_3 to be positive. We construct the weighting matrix W_{3jt} using the observed distance of a display location from the aisle of the other category so that it reflects our assumption that the influence of displays on cross-category sales affinities is inversely related to this distance. We provide additional details about the specification of W_{3jt} in Appendix A.

Cross-Category Sales Affinities Due to Purchase Coincidence

The last term, ε_{cjt}, in Equation 1 is a stacked vector of residual errors, ε_{icjt}, in the response equations for all brands in category c—that is, $\varepsilon_{cjt} = (\varepsilon_{11jt}, \varepsilon_{21jt}, \ldots, \varepsilon_{I_1 1jt}, \varepsilon_{12jt}, \varepsilon_{22jt}, \ldots, \varepsilon_{I_2 1jt})'$. We estimate the full variance–covariance matrix of these residuals in which ε_{icjt} in any store j and week t is assumed to follow a multivariate normal distribution $\varepsilon_{icjt} \sim N(0, \Sigma)$. The off-diagonal elements in Σ represent residual covariances among sales of different brands. Following Manchanda, Ansari, and Gupta (1999), we view these covariances as "sales coincidences" that are not explained by any of the effects that are controlled for in the model—namely, marketing-mix, aisle placement, and display placement effects.

Heterogeneity

Note that our specification of the spatial terms in Equation 1 incorporates heterogeneity across stores in the category-level intercepts through θ_{cj} and ϕ_{cjt}. In addition, for parsimony, we incorporate heterogeneity in only the price response parameters (Hoch et al. 1995; Manchanda, Ansari, and Gupta 1999), as Appendix A specifies.

Consistent with our discussion in the "Conceptual Development" section, our model breaks down the observed sales affinity into four components. The first component is the spatial term, $\rho(\tau_1 W_{1j} + \tau_2 W_{2j})\theta_j$, in Equation 2, which captures the extent to which sales affinity is affected by relative aisle placements in a store. The second component is the term $\rho_3 W_{3jt}\phi_{jt}$, which accounts for the influence of display placement of one category on the sales of another. The third component is the cross-category sales affinity induced by marketing-mix effects. These effects are captured by the cross-category terms in the brand price and brand display parameter matrices, N_j and Ψ. The final component of affinity that is independent of in-store merchandising and marketing-mix efforts is the covariance terms in the residual error matrix, Σ. For example, we might observe affinity between two categories because consumers may purchase them together when they undertake stock-up trips (sales coincidence).

The magnitude of the observed affinity between the categories as captured by the first three components is influenced by the intrinsic affinity between the categories. Thus, although we may induce an (observed) affinity between potato chips and detergent, for example, by placing them in adjacent aisles in a store, the magnitude of this affinity will be tempered by the intrinsic affinity between these products. Among the four components, the first three are managerially actionable because they capture the combined impact of managerial actions (e.g., aisle, display placements) and the intrinsic affinity between the categories.

A spatial model, such as the one we specify here, is appropriate for analyzing affinities between categories because affinity can be viewed as autoregression between the errors in the sales equation for the two categories. Because this autoregression is moderated by the spatial distance between the categories in a retail context, the specification in Equation 2 is referred to as a spatial autoregressive error structure.

Data and Estimation

Data

We use a store-level scanner data set provided by a supermarket chain in the United States to estimate our model. The data are available for two categories, regular cola and regular potato chips, for a period of roughly 108 weeks from November 1996 to December 1998 for 160 stores. They include information on prices, displays, and features. In addition, they contain information on aisle and display placements for the categories in each store.

These categories are prominent drivers of supermarket sales. For example, in 2005, the supermarket sales of carbonated soft drinks and potato chips were $12 billion and

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[7] For a review of such models, see Anselin (1988).

$3 billion, respectively.[8] Moreover, sales of soft drinks and salty snacks, such as potato chips, dominate supermarket sales, accounting for 21.5% and 13.2% of supermarket sales, respectively, during April 2006–March 2007 (*Nation's Restaurant News* 2007). Although we estimate the model using only two categories, we subsequently show how our methodology can be extended to include other important categories sold by the retailer when making overall decisions on aisle and display placements.

We select the top four brands in each of these categories for analysis. In the case of cola, we include the three national brands, Coca-Cola, Pepsi, and RC Cola, and a store brand (SCola). In the case of chips, we chose Lay's and Ruffles, the top two national brands, RChips, a strong regional brand, and SChips, a store brand. In both categories, the four chosen brands account for more than 90% of the total sales. We randomly select 79 stores from the 160 stores for estimating the model. The price, feature, and display variables are aggregated at the brand level using the Divisia method (Hoch et al. 1995). The display (feature) variable is defined as the percentage of all Universal Product Codes (UPCs) of the brand that are on display (feature) during a given week in a store.

PepsiCo and the retailer own brands in both categories. PepsiCo owns the Pepsi brand in the cola category and the Lay's and Ruffles brands in the chips category. The retailer owns SCola and SChips. The remaining manufacturers manage brands in only one of the categories we analyze. Table 1 presents a descriptive summary of the two categories. In the regular cola category, Coke, Pepsi, and RC Cola are the premium brands and have similar average prices, though RC Cola has a much lower market share. Coke and Pepsi are displayed and featured heavily, whereas the cheaper store brand, SCola, is displayed and featured much less frequently. The regular potato chips category presents a different, idiosyncratic scenario. In this category, Lay's and Ruffles are the most expensive brands. Moreover, the mean sales of Lay's are higher than those of Ruffles, and Lay's is displayed and featured more often than Ruffles. However, a regional brand, RChips, has the largest market share. It is competitively priced and featured the most. SChips is the cheapest brand, is displayed relatively heavily, and has the lowest market share.

In our data, aisle placements are measured by the distance between aisle locations of the two categories in the store, whereas display placements are represented by the distance of a brand's displays from the aisles containing the product categories. The aisle and display placements vary from store to store. For the aisle distances, the mean distance between the beverage and the snack aisles for all the stores is approximately 3.03 aisles, with a standard deviation of 2.72 aisles. The maximum separation between the aisles is 17. The minimum separation between them occurs when cola and chips categories are stocked facing each other on opposite sides, and this is the case for 16 stores. In another 10 stores, the two categories are located on neighboring aisles. In the case of display placements, there is both interstore and intertemporal variation. The mean distance of display placements from the cola aisle to the chip display is 12.36, with a standard deviation of 3.10 aisles. The maximum and minimum distances are 21 and 3 aisles, respectively. The mean distance between the snack aisle and the cola display is 14.36, with a standard deviation of 5.01. In this case, the maximum and minimum aisle separations are 23 and 7, respectively. We use the distances measured in aisles in the weighting matrices for the spatial error terms in our model.

Estimation

We estimate our model as a hierarchical Bayesian model, using Markov chain Monte Carlo techniques. In general, prior research has found hierarchical Bayesian models to be advantageous when modeling heterogeneity in response coefficients, as in Equation 5. For the hierarchical Bayesian model, we specify the prior distributions for the parameters of the model by using diffuse priors and conjugate distributions whenever possible.[9] We use a total of 30,000 iterations for the Markov chains with a "burn-in" of 27,500. We use the last 2500 to calculate the posterior means and the standard deviations of the model parameters. We also graphically monitor the chains for convergence.[10]

Results and Discussion

In this section, we present and discuss the results from the proposed model. We begin with a discussion of the sales affinities induced by aisle placement. Subsequently, we discuss the affinities influenced by display placement. Finally, we elaborate on the affinities due to marketing-mix variables and cross-category coincidences.

Aisle Placement–Influenced Cross-Category Sales Affinities

Table 2 presents the results on cross-category affinities obtained from the spatial component of the model. From this table, cross-category affinities influenced by aisle placements across categories are asymmetric, as measured by the correlation parameters, ρ_1 and ρ_2. Because the aisle placements influence the actual realized values of the affinities through the weighting matrices, retailers need to pay attention to the location of the categories within a store.

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[8] See *Progressive Grocer* (2005) and *Advertising Age* (2004).

[9] Details are available on request. We also performed a simulation study to check whether the model is identified and whether the parameters are recovered as per Equation 1. The parameter estimates recovered were close to the true values and lie within the 95% highest posterior density intervals. Moreover, the correlation between the true and the recovered values is high, and the mean square error (MSE) is low. For example, for the marketing-mix coefficients, the correlation is in the range of .97–.99, and the MSE is approximately .30. Similarly, for θ, the correlation between the true and the estimated values is .99, and the MSE is .20. In case of ϕ, this correlation is .80, and the MSE is 1.3. In addition, when we increase the sample size, the estimates improve for all the parameters, and the correlations between their true and their estimated values increase considerably, and the MSE drops. These findings suggest that the model is identified and that our procedure can recover the parameters successfully.

[10] In addition, we estimated parallel chains with different starting values, but the results remain unchanged.

TABLE 1
Descriptive Statistics for Sales and Marketing Variables

A: Regular Cola Category

	Mean Weekly Sales per Store (in 10,000 Ounces)				Average Price (Cents/Ounce)				Mean Percentage of UPCs Featured			Mean Percentage of UPCs Displayed			Mean Percentage of UPCs Featured and Displayed		
Brands	M	SD	Minimum	Maximum	M	SD	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum
Coke	119 58	112 73	26 78	263 24	1 87	40	1 07	2 57	37 15	0	99 99	36 63	0	99 71	20 72	0	82 61
Pepsi	138 92	106 68	60 30	323 81	1 67	23	1 10	2 04	51 79	0	99 99	31 65	0	99 85	25 50	0	85 30
RC Cola	1 38	1 68	53	5 34	1 89	32	1 23	2 14	2 24	0	100 00	1 79	0	100 00	79	0	4 75
SCola	3 74	3 71	1 26	10 50	1 34	22	83	1 59	6 67	0	98 12	11 73	0	98 40	4 23	0	55 50

B: Regular Chips Category

	Mean Weekly Sales per Store (1000 Ounces)				Average Price (Cents/Ounce)				Mean Percentage of UPCs Featured			Mean Percentage of UPCs Displayed			Mean Percentage of UPCs Featured and Displayed		
Brands	M	SD	Minimum	Maximum	M	SD	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum
Lay's	1 43	1 47	45	5 46	22 10	3 02	13 8	32 8	9 78	0	100 0	9 59	0	98 2	3 91	0	84 17
Ruffles	76	1 03	26	5 10	23 14	3 04	17 20	28 5	3 90	0	97 4	2 17	0	91 9	1 09	0	40 32
SChips	49	51	18	2 03	14 15	2 01	10 01	16 6	5 90	0	97 3	8 67	0	79 9	3 20	0	42 00
RChips	2 35	1 28	96	4 36	18 37	1 05	13 40	22 5	15 80	0	100 0	3 21	0	100 0	2 17	0	53 57

TABLE 2
Posterior Mean of Affinity Parameters

Parameter	Posterior M	Posterior SE
Aisle Placement–Influenced Affinity		
ρ_1 (affinity of cola to chips)	745	143
ρ_2 (affinity of chips to cola	501	172
τ_2 (weight due to same side)	685	201
σ_2 (ailse error)	221	027
Display Placement–Influenced Affinity		
ρ_3 (display placement affinity)	205	090
ξ_2 (display error)	008	000

Thus, locating the aisles containing the cola and chips categories closer to each other can increase cross-category affinities, leading to a greater share of customer wallet The higher value of τ_2 relative to τ_1 (which equals $1 - \tau_2$) indicates that having the chips and cola categories facing each other across the same aisle has a greater impact on cross-category sales affinity than moving the aisles of the two categories closer together by one aisle

The relative magnitudes of ρ_1 and ρ_2 suggest that the affinity of cola to chips is 49% higher than the affinity of chips to cola Typical consumption behavior may explain such an asymmetry Consumers typically feel the need to consume a drink such as cola when eating a snack such as a potato chip, but they may not feel the need to eat chips when consuming a drink Thus, from a marketing perspective, sales of chips can more effectively drive sales in the cola category than vice versa This finding implies that promotion and merchandising in the chips category may be more effective from the perspective of maximizing sales across multiple categories This implication is valuable to retailers and manufacturers in implementing cross-category management with respect to these categories Finally, σ^2 is statistically significant, suggesting that there are significant variations in category sales across stores that are not explained by affinities induced by aisle placements We subsequently discuss these residual variations across stores

Display Placement–Influenced Cross-Category Sales Affinities

From Table 2, the effect of display placements on cross-category sales affinities, as denoted by ρ_3, is also significant The implication is that retailers can use displays more effectively by positioning them closer to complementary categories to increase cross-category sales Moreover, manufacturers such as PepsiCo, which sells products in both the chip and the cola categories, should be willing to pay more for displays of their brands that are located closer to their brands' complementary category

When we compare the magnitude of ρ_3 with those of ρ_1 and ρ_2, the placement effects due to aisle distance are more prominent than those due to display placements A possible reason for this result is as follows In the case of display placement, because only one or two brands in a category are displayed at any time, only the sales from the displayed brands can create a cross-category affinity In the case of aisle placement, however, the cross-category affinity is influenced by all the brands in the aisles

Marketing-Mix Effects

Average category effects Before discussing the brand-level estimates, we consider category averages of the marketing-mix effects to understand the relative magnitudes of the effects Table 3 presents the category averages for the within- and cross-category effects for price and display and for the own-category effects of feature advertising The signs of the averages of the own-category effects conform to expectations negative price coefficients and positive display and feature coefficients Moreover, the averages for the own-category cross-effects show positive signs for price effects and negative signs for display effects, as we expected In general, the magnitude of the own-category effects is larger for the potato chips category than for the regular cola category This finding suggests that marketing-mix variables have a greater effect in the potato chips category than in the cola category

We now consider the cross-category effects reported in Table 3 The results are consistent with the pattern for own-category results in that the cross-effects of potato chips are larger than those of cola Thus, prices in the chips category have a greater effect in stimulating sales in the cola category than vice versa Among the cross-category effects included in the model, price effects are the most prominent, followed by display effects Comparing the own- and cross-category effects, we find that, in general, the own-category effects are larger than the cross-category effects, consistent with our expectation

Brand-level estimates Tables 4 and 5 report the mean parameter estimates across stores There are wide asymmetries in the effects across various brands in both categories In the cola category, for the price effects, the store brand has a greater influence on the national brands in the same category than vice versa This result is a departure from prior literature, which finds that the national brands typically steal more from lower-priced store brands than vice versa (e g , Blattberg and Wisniewski 1989, Sethuraman, Srinivasan, and Kim 1999) The price cross-elasticities in the chips category are significantly different from zero for most brand pairs, suggesting greater perceived substitutability of the brands in this category than in the cola category Furthermore, in this category, a price hike by Lay's, Ruffles, or SChips increases the sales of RChips more than any other brand RChips is the competitively priced, largest-selling brand It also has the highest price elasticity (in absolute value) It appears that customers prefer it more for its value proposition—namely, reasonable quality at reasonable price Thus, RChips benefits the most if the rival brands increase their prices, but it also loses the most if it increases its own price In contrast, Lay's, the most expensive and least price-elastic brand, may be viewed as a higher-quality brand In addition, this pattern of results holds for the cross-category price effects in Table 5 Pepsi and RChips gain the most from a price cut in their complementary categories of potato chips and cola, respectively

TABLE 3
Posterior Mean Estimates of Within- and Between-Category Effects (Simple Averaged Across Brands)

A: Price Elasticities for Regular Cola

Within-Category Effects						Between-Category Effects		
Own			Cross			Cross-Effects of Regular Potato Chips		
M	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum
–2 109	–1 486	–2 567	068	– 385	967	– 152	322	–1 596

Price Elasticities for Regular Potato Chips

Within-Category Effects						Between-Category Effects		
Own			Cross			Cross-Effects of Regular Cola		
M	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum
–2 358	–1 562	–2 819	406	– 442	1 472	– 051	612	– 745

B: Display Effects for Regular Cola

Within-Category Effects						Between-Category Effects		
Own			Cross			Cross-Effects of Regular Potato Chips		
M	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum
350	216	559	– 123	025	– 463	023	– 437	1 129

Display Effects for Regular Potato Chips

Within-Category Effects						Between-Category Effects		
Own			Cross			Cross-Effects of Regular Cola		
M	Minimum	Maximum	M	Minimum	Maximum	M	Minimum	Maximum
1 572	293	4 195	– 317	293	–1 084	067	– 285	395

C: Feature Effects for Regular Cola

	M	Minimum	Maximum
Own-Effects	283	022	585

Feature Effects for Regular Potato Chips

	M	Minimum	Maximum
Own-Effects	285	083	570

Notes In some cases (e g , price elasticities for regular cola and cross-effects of regular potato chips), the maximum has a negative sign because that is the expected direction of effect

The display effects in Table 4 indicate that sales of Lay's and Ruffles benefit strongly from displays The results (in Table 5) of the cross-category display effects illustrate how firms can use brands in multiple categories to compete effectively For example, when Coke is on display, Pepsi's sales are hurt more disproportionately than Coke's sales are when Pepsi is on display However, PepsiCo can mitigate this effect through cross-category display and price promotion of Lay's Moreover, although the sales of Pepsi drop when Coke is on display, the sales of Lay's increase, benefiting PepsiCo The display × feature interaction effect is significant only for SCola and RC Cola in the cola category and Lay's, SChips, and RChips in the chips category In general, the display × feature interaction effects are more prominent for the store brand Among the holiday and season dummies, Super Bowl, Memorial Day, Independence Day, and summer season have significant effects on sales

Model Validation

We compare the performance and the fit of the proposed model (full model) with those from several alternative models We report the alternative model descriptions and the fit statistics, as measured by the log Bayes factor for the in-sample fit and the mean square error for the out-of-sample fit, in Table 6 For each alternative model specification, the log Bayes factor reflects the ratio of the posterior odds of the full model to that of the alternative model (West and Harrison 1997) A log Bayes factor value greater than two indicates strong evidence in favor of the full model over the alternative specification For computing the out-of-sample

TABLE 4
Brand-Level Within-Category Posterior Mean Estimates of Marketing Effects and Control Variable Effects

A: Mean Price Coefficients (Elasticities)

Regular Cola

	Coke	Pepsi	RC Cola	SCola
Coke	–2 567**	– 163	– 385	446*
Pepsi	596**	–1 486**	283*	967**
RC Cola	– 067	– 120	–2 342**	159**
SCola	– 080	– 0495	– 358	–1 672**

Regular Potato Chips

	Lay's	Ruffles	SChips	RChips
Lay's	–1 562**	163*	410*	213*
Ruffles	162*	–2 399**	– 442	– 223*
SChips	– 015	393**	–2 655**	117*
RChips	1 472**	1 228**	1 397**	–2 819**

B: Display Coefficients

Regular Cola

	Coke	Pepsi	RC Cola	SCola
Coke	338*	– 023	– 180*	– 021
Pepsi	– 301*	216*	– 047	025
RC Cola	– 207*	– 127	290*	– 463**
SCola	– 017	– 015	– 102*	559**

Regular Potato Chips

	Lay's	Ruffles	SChips	RChips
Lay's	1 177**	– 225*	– 462*	– 033
Ruffles	– 570**	4 195**	– 346*	– 140*
SChips	– 366*	142*	293	047
RChips	– 665**	– 111*	–1 084**	623*

C: Feature Coefficients: Own-Effects Only

Regular Cola		Regular Potato Chips	
Coke	022	Lay's	192*
Pepsi	237	Ruffles	292*
RC Cola	585*	SChips	570*
SCola	290*	RChips	083

D· Display–Feature Interaction Coefficients. Own-Effects Only

Regular Cola		Regular Potato Chips	
Coke	389	Lay's	734*
Pepsi	306	Ruffles	– 0684
RC Cola	605*	SChips	1 042**
SCola	702**	RChips	571*

E. Holiday and Seasonal Dummies

New Year's	015	Halloween	016
Super Bowl	201**	Thanksgiving	085
Easter	005	Christmas	– 001
Memorial Day	135**	Summer	036**
Independence Day	102**	Fall	003
Labor Day	095*	Winter	– 005

*p < 10
**p < 05

Notes For the cross-elasticity estimates, the column represents the brand whose price or display variable is changed For example, in the first row of the price elasticity table (Panel A), the elasticity of Coke's sales to price change of SCola is given by 446

TABLE 5
Brand-Level Between-Category Posterior Mean Estimates of Marketing Effects and Control Variables

A: Price Coefficients (Elasticities) Cross-Effects of Chips on Cola

	Lay's	Ruffles	SChips	RChips
Coke	– 266*	– 005	– 230*	– 146*
Pepsi	–1 596**	– 097	322	– 147*
RC Cola	036	– 092	– 075	– 078
SCola	– 271*	045	– 035	– 082

Cross–Effects of Cola on Chips

	Coke	Pepsi	RC Cola	SCola
Lay's	– 140*	026	– 343*	028
Ruffles	– 175*	144	251	– 512**
SChips	– 033	152*	– 745**	085
RChips	– 329**	– 172*	612	344*

B: Display Coefficients Cross-Effects of Chips on Cola

	Lay's	Ruffles	SChips	RChips
Coke	176*	– 199	– 117	– 012
Pepsi	1 129*	– 137	104	007
RC Cola	236	– 437	– 059	– 304
SCola	– 062	014	042	– 025

Cross-Effects of Cola on Chips

	Coke	Pepsi	RC Cola	SCola
Lay's	117*	– 047	– 285	– 106
Ruffles	063	– 058	140*	149*
SChips	– 010	018	314**	083
RChips	245**	– 185	395**	229**

*p < 10
**p < 05

fit, we first divide the data for each store into two halves, each comprising 54 weeks We reestimate the models on the first half and use the second half for prediction From the fit statistics, we find that the full model outperforms all the other model specifications for both in-sample and out-of-sample statistics Moreover, the null model, which does not include cross-category sales affinities as influenced by aisle and display placements, performs substantially worse than the other models that incorporate such effects We conclude that aisle and display placement–influenced cross-category affinities are important in explaining the data

Managerial Implications

The Impact of Aisle and Display Placements Across Categories

Both retailers and manufacturers can benefit from an increased understanding of the impact of in-store merchandising decisions on cross-category sales Indeed, in many instances, the same manufacturer markets complementary categories and also serves as the category captain, helping the retailers manage those categories in the store (*Convenience Store News* 2007, *Progressive Grocer* 2004b)

To analyze the cross-category impact of aisle management, we compute the effect of aisle placements on sales (for the results, see Table 7, for details on how we compute effects and elasticities, see Appendix A) [11] We calculate the elasticities and effects for four scenarios In Case 1, we move the categories of chips and cola one aisle closer in all the stores in the chain, in Case 2, we move the categories of chips and cola one aisle farther in all the stores, in Case 3, we move the categories of chips and cola so that they face each other in 55% of the stores, and in Case 4, we move the categories so that they face each other in 55% of the stores and are one aisle closer in the remaining stores [12]

Table 7 shows that moving the categories one aisle closer results in a modest increase in sales However, moving the categories so that they face each other in 55% of the stores leads to a substantial increase in mean sales [13] More-

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[11] Both retailers and manufacturers can estimate our model using a standard statistical package, such as SAS with a manager-friendly interface in Excel or Visual Basic

[12] In our data, the categories face each other in an aisle in approximately 20% of the stores (16 of the 79 stores) For the sales impact analysis, we consider the case in which the categories are relocated to face each other in an additional 27 stores, leading to 55% (or a majority) of stores with the categories facing each other in an aisle For simplicity, we do not consider the effects on the categories displaced by moving the cola and chips aisles closer

[13] Note that the increase in the sales of Case 4 is not the sum of the increases in Cases 1 and 3, because the specified model is not

TABLE 6
Model Equations and Fit Statistics of Proposed and Alternative Models

Model	Model Equation	In-Sample Model Fit (Log Bayes Factor)	Out-of-Sample Model Fit (Mean Square Error)
Proposed model asymmetric aisle and display placement effects (full model)	$\ln(S_{cjt}) = B + N_j \ln(p_{cjt}) + \psi d_{cjt} + \Gamma f_{cjt} + \Pi d_{cjt} \times f_{cjt} + \chi Season_{cjt} + \eta Holiday_{cjt} + \theta_{cj} + \phi_{cjt} + \varepsilon_{cjt}$	N A	799
Alternative Model 1 no display placement effects	$\ln(S_{cjt}) = B + N_j \ln(p_{cjt}) + \psi d_{cjt} + \Gamma f_{cjt} + \Pi d_{cjt} \times f_{cjt} + \chi Season_{cjt} + \eta Holiday_{cjt} + \theta_{cj} + \varepsilon_{cjt}$	28 895	854
Alternative Model 2 no asymmetric effects in aisle placement and no display placement effects	$\ln(S_{cjt}) = B + N_j \ln(p_{cjt}) + \psi d_{cjt} + \Gamma f_{cjt} + \Pi d_{cjt} \times f_{cjt} + \chi Season_{cjt} + \eta Holiday_{cjt} + \theta_{cj} + \varepsilon_{cjt}$ with $\rho_1 = \rho_2$	31 857	873
Alternative Model 3 no aisle placement effects and no display placement effects (null model)	$\ln(S_{cjt}) = B + N_j \ln(p_{cjt}) + \psi d_{cjt} + \Gamma f_{cjt} + \Pi d_{cjt} \times f_{cjt} + \chi Season_{cjt} + \eta Holiday_{cjt} + \varepsilon_{cjt}$	860 013	988

Notes N A = not applicable

over, the increase in mean weekly sales is considerably different across brands For example, in Case 1, the sales of Coke and Pepsi rise appreciably, whereas those of RC Cola change negligibly In the chips category, the sales of RChips increase the most Similar patterns can be observed for other cases as well Thus, stronger brands benefit more than weaker brands from these aisle placement changes

We perform a similar analysis for display adjacencies However, the effects of display adjacencies are not substantial because of the smaller magnitude of the display spatial correlation parameter ρ_3, as we discussed previously

Our analysis considers the effect of aisle and display changes on the sales of only the two focal categories To make comprehensive decisions on aisle and display placements, a retailer needs to consider the effects of aisle and display changes on the sales of other key product categories as well In such a situation, our model can be extended to analyze the affinities related to these additional categories

The Impact of Aisle Placements on Sales of a Third Category

In this section, we show how the inclusion of other categories in the analysis modifies the previous results on the sales impact of moving the aisle locations of cola and chips closer together We illustrate this analysis by simulating the effects of a third category, nonrefrigerated/shelf juice (e g , cranberry juice) The simulation consists of the following steps In Step 1, with the third juice category under consideration, we simulate a model similar to Equation 1 for the two category pairs, juice–cola and juice–chips, to supplement our analysis of the cola–chips pair We use the proposed model pairwise across categories because this approach is reasonable and avoids the risk that specification error in one category will contaminate the results for all the categories Because we could not obtain real data on the juice category for the same period as that for cola and chips, we assume "reasonable" parameters for the model for the category pairs (i e , juice–cola and juice–chips) We base these reasonable parameters (elasticities) on current juice category data that we obtained from another source[14]

In Step 2, in the models for the juice–cola and juice–chips pairs, we add a separate weighting matrix whose elements take the value of one if the juice aisle is located between the cola and chips aisles and zero if otherwise We describe this model in greater detail in Appendix B By adding a separate weighting matrix to indicate the location of the juice category between the chips and cola categories, we can incorporate the juxtaposition effects on the juice category similar to those that Drèze, Hoch, and Purk (1994) observe for shelf locations within an aisle We further assume that the juxtaposition effects are not important for cola and chips because of the strong complementarities that exist between them In other practical applications, managerial judgment can help make such simplifications in the model

We now reconsider our analysis of Case 3 in Table 7 by including the juice category Recall that in this case, the chips and cola categories are moved so that they face each other in 55% of the stores We assume that the relative location of the juice category with respect to the cola and chips categories in these target stores conforms to one of three possible layouts (1) cola–juice–chips, (2) cola–chips–juice, and (3) juice–cola–chips in equal proportion These layouts differ in the identity of the middle category among the three categories Thus, a store with the first layout has the juice aisle located between those of the cola and potato chips categories Because we do not consider shopping paths, we are agnostic to the order of these three categories (i e , left

---

strictly linear For example, both the distance measures are inverse exponential

[14] We obtained the current juice data from another northeastern U S supermarket chain that operates approximately 70 stores

TABLE 7
Effects of Changes in Aisle and Display Placements on Store Unit Sales and Revenues

Case	Brand	Mean Total Change in Weekly Sales (Quantity in Ounces)	Mean Change in Total Category Weekly Sales (Percentage)	Mean Total Change in Weekly Revenues ($)
Case 1 moving the potato chips and regular cola categories one aisle closer in all the stores in the chain	Coke	92,358	76%	1,727
	Pepsi	107,299		1,792
	RC Cola	1067		20
	SCola	2887		39
	Lay's	628		138
	Ruffles	333		77
	SChips	217		30
	RChips	1031		186
	Total	205,820		4,009
Case 2 moving the potato chips and regular cola categories one aisle farther in all the stores in the chain	Coke	–145,200	–1 452%	–2,715
	Pepsi	–168,689		–2,817
	RC Cola	–1678		–32
	SCola	–4538		–61
	Lay's	–2757		–607
	Ruffles	–1461		–336
	SChips	–953		–133
	RChips	–4527		–815
	Total	–329,803		–7,516
Case 3 moving the potato chips and regular cola categories so that they face each other in 55% of the stores in the chain	Coke	1,122,845	9 23%	20,997
	Pepsi	1,304,489		21,785
	RC Cola	12,975		245
	SCola	35,095		470
	Lay's	878		193
	Ruffles	465		107
	SChips	303		42
	RChips	1441		259
	Total	2,478,492		44,100
Case 4 moving the potato chips and regular cola categories so that they face each other in 55% of the stores and are closer by one aisle in all other stores in the chain	Coke	1,287,761	10 59%	24,081
	Pepsi	1,496,083		24,985
	RC Cola	14,881		281
	SCola	40,250		539
	Lay's	1994		439
	Ruffles	1057		243
	SChips	690		97
	RChips	3274		589
	Total	2,845,989		51,254

to right versus right to left) Conforming to the assigned layout, we randomly generate the aisle location of the juice category for the different stores Unlike the two-category Case 3 in Table 7, the results of the three-category Case 3 may depend on whether the chips or the cola category is moved Furthermore, the implications may depend on the specific layout (1, 2, or 3) in the given store

Table 8 presents the modified simulation results for Case 3 when the juice category is included The baseline result represents the Case 3 values from Table 7, except that these values are now broken down by the store layout Note that the Layout 3 stores have a greater improvement in revenues in the baseline case than the other two layouts The greater improvement in these stores is simply a chance variation because stores were assigned randomly to the three layouts Below the baseline results, we separately present the simulation results for moving the cola category to face the chips category (Scenario 1) and for moving the chips category to face the cola category (Scenario 2) Note that the spatial parameters assumed in our simulation (for the parameter values, see Appendix B) imply that there is a positive affinity (as influenced by aisle placement) between juice and chips and between juice and cola However, the assumed affinity is greater for the juice–chips pair than for the juice–cola pair A comparison of the results in Table 8 for both scenarios with the baseline results shows that the improvement in revenues is slightly higher when the juice category is included in the analysis However, this overall improvement masks differences across stores with different layouts When the cola category is moved, it has an adverse effect on the juice category in stores with Layout 3 The rationale is that the cola category is moved away from the juice aisle in stores with Layout 3, causing a decrease in cola-affinity-driven juice sales in these stores However, juice sales are not adversely affected in stores with Layout 1, though the juice category is no longer juxtaposed between cola and chips This result shows that the juxtaposition effect (based on the value of τ_3 in Appendix B) is not

TABLE 8
Simulation Results for Case 3 with a Third Category (Juice)

Simulation	Store Layout	Mean Total Change in Weekly Revenues ($)			
		Cola	Chips	Juice	Total
Baseline	Layout 1 stores	13,081	149	N.A.	13,230
	Layout 2 stores	13,952	160	N.A.	14,113
	Layout 3 stores	16,569	189	N.A.	16,758
	Total	43,602	498	N.A.	44,100
With juice (Scenario 1)	Layout 1 stores	13,170	164	67	13,400
	Layout 2 stores	14,033	161	64	14,257
	Layout 3 stores	16,386	188	–75	16,500
	Total	43,588	512	56	44,157
With juice (Scenario 2)	Layout 1 stores	13,170	164	182	13,515
	Layout 2 stores	14,033	161	–248	13,945
	Layout 3 stores	16,386	188	199	16,773
	Total	43,588	512	133	44,233

Notes: N.A. = not applicable.

high enough to adversely affect juice in stores with Layout 1.

In Scenario 2, in which we move the chips category, we observe an adverse effect on juice in stores with Layout 2 because chips move away from the juice aisle in these stores. Furthermore, because the affinity between juice and chips is stronger than that between juice and cola (for parameter, see Appendix B), the effects, both positive and negative, on juice are stronger when chips are moved (Scenario 2) than when cola is moved (Scenario 1). Indeed, Table 8 suggests that we can obtain better overall results by implementing Scenario 1 in stores with Layout 2 while adopting Scenario 2 in stores with Layouts 1 or 3. Overall, the simulation results of this section show that our methodology is fairly robust and can be extended to accommodate more categories.

Comparison of the Effects of Aisle Placements and Marketing-Mix Variables

An issue of managerial significance is the magnitude of the sales effects of aisle adjacencies compared with those of the traditional marketing-mix variables. For this comparison, we compute the elasticities with respect to the merchandising and marketing-mix variables (i.e., price, feature, and displays). In each of these cases, we change the relevant variable by 1% and calculate the corresponding change in sales. Because we operationalize the display (feature) variable as the percentage of all UPCs of the brand on display (feature), a unit percentage increase in this variable corresponds to a 1% increase in UPCs displayed (featured).

The results of the comparison of elasticities of merchandising and marketing variables appear in Table 9. To achieve the same change in sales produced by a unit decrease in interaisle distance, the retailer needs an overall price cut of 3.84% (.48% per brand). Similarly, to mimic the same increase in sales as in Case 3 (55% of stores with categories facing each other), the retailer requires a price cut of 37.07% per brand. Likewise, for merchandising variables, the retailer needs to increase display frequency by 11.52% per brand and feature frequency by 59.42% per brand to achieve the same sales as that achieved by moving the categories closer by an aisle. These results indicate that aisle placements and adjacencies can have as much an influence on sales as traditional marketing-mix variables, such as price, display, and feature. Thus, both retailers and manufacturers should pay close attention to aisle placements to increase sales, share of the customer wallet, and total profit.

Customizing Aisle Placement Strategies to Stores

Our analysis does not consider the costs of making changes in aisle placements. These costs may vary across stores. However, if we have access to the costs of changing aisle placements for each store, we can make customized recommendations on aisle placements for each store because we estimate the affinities induced by aisle placements at the individual store level (in θ_{cj}). Furthermore, because our model also identifies marketing-mix effects at the individual store level, we can identify stores that are more prone to aisle placement–induced affinities than to marketing-mix effects. Therefore, the results of our model calibration can be used to achieve a broader profit optimization through customized aisle placement and marketing-mix strategies for each store, depending on the store's responsiveness to these two variables. For example, depending on the relative responsiveness to these variables and the costs that might be incurred in implementing the store layout changes, certain stores may be targeted for better implementation of aisle management programs, and others may be selected for campaigns involving conventional merchandising/marketing-mix variables.

Analysis of Residual Effects for Affinities

Aisle adjacencies are only one aspect of a store that affects sales affinities between categories. Other features, such as aisle width, store lighting, ease of navigation, and store congestion, may also affect the sales affinities between categories. Although our model accounts for aisle adjacencies through the weighting matrices in Equation 2, it absorbs the affinity induced by other store factors in the residual store effects, u_j. It may be useful for retail chain managers to ana-

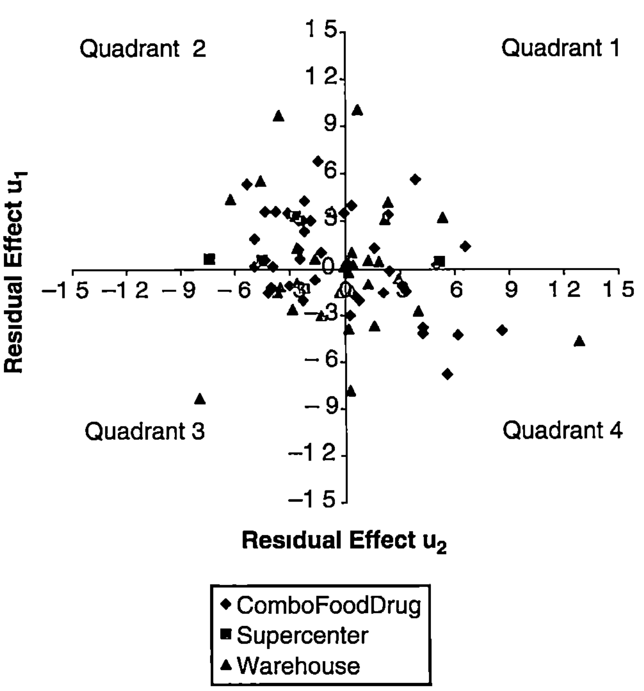
TABLE 9
Comparison of Required Changes in Merchandising and Marketing Variables for Desirable Outcomes

Variable	Brand	Elasticity	Average Change in Variable to Achieve the Same Effect as That by Bringing Aisle Closer by One	Average Change in Variable for the Same Effect if Categories Face Each Other in 55% of Stores
Price	Coke	2 567	3 84% (48% per brand)	37 07% (4 63% per brand)
	Pepsi	1 486		
	RC Cola	2 342		
	SCola	1 672		
	Lay's	1 567		
	Ruffles	2 395		
	SChips	2 655		
	RChips	2 819		
	M	2 187		
Display	Coke	112	92 19% (11 52% per brand)	892 43 (111 55% per brand)
	Pepsi	069		
	RC Cola	009		
	SCola	065		
	Lay's	110		
	Ruffles	090		
	SChips	025		
	RChips	020		
	M	063		
Feature	Coke	004	475 32% (59 42% per brand)	4235 75% (529 47% per brand)
	Pepsi	075		
	RC Cola	002		
	SCola	016		
	Lay's	018		
	Ruffles	014		
	SChips	042		
	RChips	050		
	M	028		

lyze further the estimated residual store effects, $\hat{u}_j$, to identify stores that are underperforming or overperforming with regard to aisle placement affinities Such an analysis can help managers identify the actionable conditions associated with overperforming stores and implement them in other stores

An example of such an analysis appears in Figure 1, which plots the residual store effects for each category along the two axes The stores in Quadrant 1 have positive residuals for the effects of both cola on chips ($\hat{u}_1$) and chips on cola ($\hat{u}_2$) The positive residuals suggest that sales in both categories in these stores exceed those predicted by the affinity influenced by aisle placements Moreover, because residuals are higher in both categories, there is affinity between the categories in these stores due to factors other than aisle placements alone For these reasons, the stores in Quadrant 1 can be viewed as performing better in inducing affinities between the two categories The individual characteristics of these stores can be explored to develop prescriptions to improve the performance of other stores in the chain Further analysis reveals that this quadrant consists of approximately 21% of the total stores The frills-free warehouse format is the predominant format (56%) among these stores The other types of stores in the data include a combination of food and drugstores and supercenters, which typically sell a wider range of merchandise

FIGURE 1
Plot of the Residual Store Effects



In contrast, stores in Quadrant 3 can be viewed as underperforming with respect to cross-category affinities because sales of both categories in these stores are below the levels predicted by the aisle placements Thus, both the internal and the external environments for these stores need further investigation to pinpoint the factors that might be contributing to their below-average performance Stores in Quadrants 2 and 4 represent stores that perform well in one category but are below average in the other category

To increase affinity-driven sales in the underperforming category of stores in Quadrants 2 and 4 and to improve cost efficiency across stores, a retail chain could incorporate the features of the overperforming stores of Quadrant 1 Burke and Payton (2006) note several store characteristics beyond aisle placements that may increase purchases of complementary products These factors include having good store signage, reducing clutter, and having wide aisles to facilitate shopper navigation Retailers could pay attention to these additional factors in underperforming stores to improve cross-category performance As another example, warehouse format stores stock a narrow assortment of large pack sizes of adjacent categories that could make them salient in shopper consideration and induce high sales affinities Retailers could suitably modify the assortment and pack sizes on the shelves in underperforming stores to improve salience and cross-category affinity

Conclusions, Limitations, and Further Research

In this article, we develop and estimate a spatial model using store-level data to study the effects of aisle and display placements on cross-category brand sales, while controlling for the effects of marketing-mix activities Our results show that the effects of aisle and display placements on cross-category sales are significant and asymmetric Among the two placement variables, the effect of aisle adjacencies is stronger than that of display adjacencies Importantly, the sizes of these effects match or exceed those of marketing-mix variables (i e , price, feature, and display)

This research has important implications for both retailers and manufacturers because cross-category marketing programs depend on both manufacturers' incentives and retailers' willingness to implement such programs Retailers can use the model results to make better aisle location and display decisions to increase overall sales and profitability Moreover, they can exploit asymmetric sales affinities by making appropriate trade-off decisions For example, if bringing the aisles of two categories (e g , cola and chips) closer together to leverage sales affinities results in overcrowding of the aisles, the retailer can decide on the level of aisle separation required to achieve the desired overall sales lift by focusing on the sales of the category that benefits more from the asymmetry Our simulation results with three categories show that asymmetric effects can be critically important in deciding which of two categories to move toward the other because each category may differentially affect a third category as a result of asymmetric effects Furthermore, by comparing the differences in the aisle-induced affinities and marketing variables–induced affinities for the two categories, the retailer can better evaluate the payoffs from changing the aisle locations of the two categories compared with those from changing the marketing mix

Manufacturers can use the results to better coordinate cross-category marketing programs and to cooperate effectively with retailers to encourage sales across their multiple brands Given that current cross-category management initiatives tend to be more at a macro level and less detailed, our research can provide the necessary tool for manufacturers and retailers to apply detailed analysis to two or more selected categories to realize the value potential from such initiatives

This research has certain limitations that further research could address First, we performed the empirical analysis for two categories and a simulation for a third category Other researchers could extend this analysis across more high-volume categories, for example, to a retailer's decision-support system for store layout decisions Second, we consider only the effects of relative aisle placements on cross-category sales Managers would also need to decide the absolute location of the aisles in the store (e g , the direction and distance from store entrance) We could not obtain such data in our study, but future studies could collect such data and develop models to aid absolute aisle placement decisions Third, although we glean insights into the effects of aisle and display placements on cross-category affinities using sales data, some researchers are beginning to examine customers' shopping paths for additional insights into store layout decisions (Hui, Fader, and Bradlow 2007) If such data were more readily available, researchers could seek triangulation of the affinity analysis results we illustrate herein with those from the analysis of shopping paths Fourth, in some cases, aisle and display placement decisions may be influenced by factors such as trade deals and local market conditions Further research could explore this endogeneity if relevant data on these factors are available Finally, retailers are testing or using newer in-store technologies, such as radio frequency identification–enabled shopping carts, personal shopping assistants, and electronic displays, to improve shopability The importance of these technologies in enhancing shopability may depend on consumers' perceptions of their values, both independently and in their interactions with merchandising decisions, such as those regarding aisle and display placements Future studies could investigate the role of these technologies in influencing cross-category sales

Appendix A

The matrix details of Equation 1 are specified in Table A1 In Equation 1, N_j and Ψ are $(I_1 + I_2) \times (I_1 + I_2)$ matrices, and $\Gamma = \gamma_1\mathbf{I}$, where $\mathbf{I}$ is an identity matrix of dimension $(I_1 + I_2) \times (I_1 + I_2)$, where I_1 and I_2 are the numbers of brands within each of the two categories Note that our specification allows for a full unrestricted matrix of cross-brand estimates for prices and displays in the form of N_j and Ψ, respectively, while we estimate own effects using Γ and Π for feature and display × feature interaction, respectively (Manchanda, Ansari, and Gupta 1999, Montgomery 1997) We also estimated an alternative model in which we allow

TABLE A1
Matrix Details of Equation 1

$$
\begin{bmatrix} \ln(S_{1cjt}) \\ \ln(S_{2cjt}) \\ \\ \ln(S_{1'c'jt}) \\ \ln(S_{2'c'jt}) \\ \\ \end{bmatrix}
=
\begin{bmatrix} \beta_1 \\ \beta_2 \\ \\ \\ \\ \\ \end{bmatrix}
+
\begin{bmatrix} \eta_{11cj} & \eta_{12cj} & \eta_{11'c'j} & \eta_{12'c'j} \\ \eta_{21cj} & \eta_{22cj} & \eta_{21'c'j} & \eta_{22'c'j} \\ \\ \eta_{1'1cj} & \eta_{1'2'cj} & \eta_{1'1'c'j} & \eta_{1'2'c'j} \\ \eta_{2'1'cj} & \eta_{2'2'cj} & \eta_{2'1'c'j} & \eta_{2'2'c'j} \\ \\ \end{bmatrix}
\begin{bmatrix} p_{1cjt} \\ p_{2cjt} \\ \\ p_{1'c'jt} \\ p_{2'c'jt} \\ \\ \end{bmatrix}
+
\begin{bmatrix} \phi_{11c} & \phi_{12c} & \phi_{11'c'} & \phi_{12'c'} \\ \phi_{21c} & \phi_{22c} & \phi_{21'c'} & \phi_{22'c'} \\ \\ \phi_{1'1c} & \phi_{1'2'c} & \phi_{1'1'c'} & \phi_{1'2'c'} \\ \phi_{2'1'c} & \phi_{2'2'c} & \phi_{2'1'c'} & \phi_{2'2'c'} \\ \\ \end{bmatrix}
\begin{bmatrix} d_{1cjt} \\ d_{2cjt} \\ \\ d_{1'c'jt} \\ d_{2'c'jt} \\ \\ \end{bmatrix}
$$

$$
+
\begin{bmatrix} \gamma_{11c} & 0 & 0 & 0 \\ 0 & \gamma_{22c} & 0 & 0 \\ \\ 0 & 0 & \gamma_{1'1'c'} & 0 \\ 0 & 0 & 0 & \gamma_{2'2'c'} \\ \\ \end{bmatrix}
\begin{bmatrix} f_{1cjt} \\ f_{2cjt} \\ \\ f_{1'c'jt} \\ f_{2'c'jt} \\ \\ \end{bmatrix}
+
\begin{bmatrix} \pi_{11c} & 0 & 0 & 0 \\ 0 & \pi_{22c} & 0 & 0 \\ \\ 0 & 0 & \pi_{1'1'c'} & 0 \\ 0 & 0 & 0 & \pi_{2'2'c'} \\ \\ \end{bmatrix}
\begin{bmatrix} d_{1cjt} \times f_{1cjt} \\ d_{2cjt} \times f_{2cjt} \\ \\ d_{1'c'jt} \times f_{1'c'jt} \\ d_{2'c'jt} \times f_{2'c'jt} \\ \\ \end{bmatrix}
+ \chi
\begin{bmatrix} 1 \text{ or } 0 \\ 1 \text{ or } 0 \\ \\ 1 \text{ or } 0 \\ 1 \text{ or } 0 \\ \\ \end{bmatrix}
+ \eta
\begin{bmatrix} 1 \text{ or } 0 \\ 1 \text{ or } 0 \\ \\ 1 \text{ or } 0 \\ 1 \text{ or } 0 \\ \\ \end{bmatrix}
+
\begin{bmatrix} \theta_{cj} \\ \theta_{cj} \\ \\ \theta_{c'j} \\ \theta_{c'j} \\ \\ \end{bmatrix}
+
\begin{bmatrix} \phi_{cjt} \\ \phi_{cjt} \\ \\ \phi_{c'jt} \\ \phi_{c'jt} \\ \\ \end{bmatrix}
+
\begin{bmatrix} \varepsilon_{1cjt} \\ \varepsilon_{2cjt} \\ \\ \varepsilon_{1'c'jt} \\ \varepsilon_{2'c'jt} \\ \\ \end{bmatrix}
$$

for the full matrix of responses in case of display × feature interaction The results were similar

Additional Details Regarding Equations 2–4

Formally, $\theta_j = [\theta_{1j}, \theta_{2j}]'$ and $u_j = [u_{1j}, u_{2j,}]'$ in Equation 2 We assume that $u_j \sim N(0, \sigma^2 \mathbf{I})$, where $E(u_j u_k) = 0$ for $j \neq k$ We specify the spatial correlation parameter matrix ρ as follows $\rho = [\mathbf{R}_1 \mathbf{R}_2]$, where $\mathbf{R}_1$ is a $I_1 \times 1$ vector whose elements are all equal to ρ_1 and $\mathbf{R}_2$ is a $I_2 \times 1$ vector whose elements are all equal to ρ_2 with $\{\rho_1, \rho_2\} \in (-1, 1)$ In Equation 4, $\phi_{jt} = [\phi_{1j}, \phi_{2j}]'$ and υ_{jt} is a 2×1 vector of nonspatial errors, one for each category, with each error assumed to be independently distributed as $N(0, \xi^2)$

Description of the Weighting Matrices

The weighting matrices, W_{1j} and W_{2j}, used in Equation 2 have the following structure to reflect aisle placements of the categories

$$
W_{1j} = \begin{pmatrix} \mathbf{O}_1 & \mathbf{D}_{1j} \\ \mathbf{D}_{2j} & \mathbf{O}_2 \end{pmatrix} \qquad W_{2j} = \begin{pmatrix} \mathbf{O}_1 & \mathbf{S}_{1j} \\ \mathbf{S}_{2j} & \mathbf{O}_2 \end{pmatrix},
$$

where $\mathbf{O}_1$ and $\mathbf{O}_2$ represent square matrices of zeroes with dimensions I_1 and I_2, respectively, and $\mathbf{D}_{1j}$ and $\mathbf{D}_{2j}$ are matrices of dimensions $I_1 \times I_2$ and $I_2 \times I_1$, respectively, whose elements are all equal to $1/\exp(d_j)$ (Yang and Allenby 2003), where d_j is the distance between the aisle locations of the two categories in store j Thus, in line with the practice in the spatial modeling literature, the diagonal matrices in W_{1j} are zero because they correspond to brands in the same category and do not pertain to cross-category sales affinities In contrast, the cross-category sales affinities are allowed to vary inverse exponentially with the distance between the aisle locations of the two categories through the off-diagonal matrices, $\mathbf{D}_{1j}$ and $\mathbf{D}_{2j}$ Similarly, in the weighting matrix W_{2j}, the off-diagonal matrices, $\mathbf{S}_{1j}$ and $\mathbf{S}_{2j}$, are indicator matrices of dimensions $I_1 \times I_2$ and $I_2 \times I_1$, respectively, whose elements equal one if both Categories 1 and 2 in store j are on opposite sides of the same aisle and zero if otherwise Thus, the matrix W_{2j} captures the cross-category affinities that arise from both categories being on the opposite sides of the same aisle

We specify the weighting matrix W_{3jt} used in Equation 4 as follows

$$
W_{3jt} = \begin{pmatrix} 0 & \dfrac{1}{\exp\delta_{2jt}} \\ \dfrac{1}{\exp\delta_{1jt}} & 0 \end{pmatrix}
$$

Again, only the off-diagonal elements of W_{3jt} interact with cross-category components of ϕ_{jt}, so the diagonal elements are set to zero For store j in week t, the off-diagonal element above the diagonal in W_{3jt} is inverse exponentially related to the distance, δ_{2jt}, of the display in Category 2, as measured from the aisle in which Category 1 is stocked This element captures variation in cross-category sales affinity induced in Category 1 due to changes in display placements in Category 2 The interpretation of the other off-diagonal element in W_{3jt} is analogous In computing δ_{1jt} and δ_{2jt} for a given week t, we average the distance measures of all the displayed brands in a category if more than one brand is displayed However, in our data, only one brand is displayed per week approximately 80% of the time Moreover, we find that for some store weeks, none of the brands in a category are on display For these store weeks, we let the corresponding off-diagonal element of W_{3jt} have a very small value of the order of 0005 This is equivalent to assigning a large value to δ_{1jt} or δ_{2jt}

Heterogeneity

To specify heterogeneity in the price parameters, let $\beta_j' = [\text{vec}\ (N_j)']$ Our specification for heterogeneity in β_j is as follows

$$\beta_j = Z_j\Delta + K,\ K \sim N(0, V_\beta),$$

where the matrix Z contains demographic and competitor variables apart from the constant term and Δ is the corresponding matrix of coefficients We mean-center the demographic and competitor variables so that we can interpret the constant term as the response for an average store Furthermore, for parsimony, we allow all the price effects to have the same set of demographic estimates (Montgomery 1997)

Computation of Elasticities

We compute the elasticities with posterior draws used in the estimation of the model parameters (Allenby and Lenk 1994) per Equation 1, with the following expressions for the spatial error components

$$\theta_{new} = (I_\theta - \rho W_{new})^{-1}\hat{u},\ \text{and}\ \phi_{new} = (I_\phi - \rho_3 W_{3new})^{-1}\hat{\upsilon},$$

where $\hat{u}$ and $\hat{\upsilon}$ are computed from Equations 2 and 4, respectively (Case 1991) When we compute the effect of changes in aisle or display placements, such changes result in a revision of the appropriate weighting matrices, these are indicated by W_{new} and W_{3new} in the preceding expressions

Appendix B

Augmented Model Assumed for Cola–Juice and Chips–Juice

The augmented model assumed for the affinity between cola and juice and chips and juice is similar to Equation 1, except that display distances were not modeled, thus, ϕ_{cjt} = 0 Furthermore, we modify Equation 2 as follows

$$\theta_j = \rho\left(\tau_1 W_{1j} + \tau_2 W_{2j} + \tau_3 W_{4j}\right)\theta_j + u_j$$

Thus, we assume a third weighting matrix, W_{4j}, in the formulation for θ_j to account for juxtaposition effects Furthermore, we assume that $\tau_1 + \tau_2 + \tau_3 = 1$ We specify the matrix W_{4j} analogous to W_{2j}, except that the off-diagonal elements equal one in the case of W_{4j} if the drink category is juxtaposed between the cola and chips categories and zero if otherwise

Key Simulation Parameters

Parameter	Cola–Juice	Chips–Juice
ρ_1 (e g , cola–juice affinity)	30	55
ρ_2 (e g , juice–cola affinity)	20	35
τ_2	30	30
τ_3	20	20

We assume that the strength of the complementarity between the juice–chips category pair is higher than that for the juice–cola category pair This assumption is based on the reasoning that consumers might purchase a drink when they buy chips, though such behavior might not exist for juice–cola purchases However, the purchases in these categories might still be positively related because of the location of these categories within the store and because consumers might buy both juice and cola together Thus, we assume that the affinity due to aisle distances is stronger (and positive) for juice–chips and weaker (and positive) for juice–cola We also assume that the magnitude of the affinity due to the juice category juxtaposed between chips and cola is lower than the affinity due to both the respective aisle distances and their presence on the same side of the aisle

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Nina Diamond, John F. Sherry Jr., Albert M. Muñiz Jr., Mary Ann McGrath, Robert V. Kozinets, & Stefania Borghini

American Girl and the Brand Gestalt: Closing the Loop on Sociocultural Branding Research

This article describes an investigation of the American Girl brand that provides a more complete and holistic understanding of sociocultural branding. Recent research on emotional branding, together with prior work on brands' symbolic nature and their role as relationship partners, represents a significant shift in the way marketers think about brands and brand management. However, a full understanding of powerful and emotionally resonant brands has been elusive, in part because sociocultural branding knowledge has accumulated in a piecemeal way and lacks coherence and integrity. In addition, powerful brands are extraordinarily complex and multifaceted, but in general they have been studied from a single perspective in a single setting. On the basis of a qualitative exploration of the American Girl brand that is both deep and broad, the authors posit that an emotionally powerful brand is best understood as the product of a complex system, or gestalt, whose component parts are in continuous interplay and together constitute a whole greater than their sum. Studying American Girl from the perspectives of various stakeholder groups in many of the venues in which the brand is manifest, the authors attempt to close the sociocultural branding research loop and identify implications for brand management.

Keywords: American Girl, brands, retail, brand management

> Approaching from any direction, the first glimpse is of the giant bas relief sign, three neat rows of red awnings, and two American flags waving vigorously in the Chicago wind. Closer proximity to the magisterial glass doors amplifies the electric buzz of conversation among excited girls and women. Big smiles adorn the faces of those carrying even bigger red paper bags with stark white lettering. The venue is unmistakable: American Girl Place. Inside the store, small groups of women and girls swarm around a variety of perfectly staged displays of dolls, accessories, and books in a large, bright room. Incessant verbal exchange among the occupants is punctuated by activity that involves the touching, lifting, conveying, and replacing of small adored objects. The scene incorporates a surprising number of girl–doll twins, that is, young girls dressed identically to their dolls. Some dolls seem to be made in the images of their owners, with the same facial configuration, hair color and style, and eye shape and hue. Poses are struck, and cameras flash to record the shared moment. (Excerpt from researcher field notes)

Created by a former schoolteacher in 1985, the American Girl brand is a $436 million empire (Mattel Inc. 2007) that includes books, dolls, and doll clothing and accessories, as well as immersive retail and catalog environments. Envisioned as a means of bringing history alive and selling it to children in the form of dolls and books (Morriss 2003; Sloane 2002), American Girl has transcended its product categories to become a brand powerhouse that adds new meaning and relevance to long-established toys (Acosta-Alzuru and Kreshel 2002; Acosta-Alzuru and Roushanzamir 2003).

Dolls representing nine different historical periods and a variety of ethnicities come replete with elaborate narratives and accoutrements. Girls create intricate backstories for their dolls, intertwining content from the books with their own family histories. Mothers, daughters, and grandmothers trek from around the country to visit one of the three American Girl Place stores, experience the brand, and create strong and lasting shared memories. Its treatment in the popular press and the fervor with which large numbers of adherents embrace the brand indicate that American Girl has become something of a cultural icon and has earned a position within the ranks of powerful emotional brands (Gobe 2001; Roberts 2004; Zaltman 2003). Instrumental in this achievement is a complex constellation of meanings

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rooted in narrative and distributed among the brand's many and varied constituencies

In 1998, American Girl was acquired by the toy titan Mattel for $700 million That same year, the company opened its flagship brand store, American Girl Place, a half block from Chicago's Magnificent Mile Nancye Green, the store's designer, referred to the retail outlet as "a mecca, a pilgrimage site for girl consumers" (Lavin 2003, p 79) At the time, more than five million people had visited the Chicago location Brilliantly designed and executed, American Girl Place consists of three sales floors, comprising 35,000 square feet of back-to-the-future retroscape ambiance Inside can be found museum-like dioramas, a theater, a café, a doll hair salon, and lounging areas designed to facilitate interaction among shoppers and the examination and use of products Enthusiastic hordes of girls and women can be seen striding down Michigan Avenue, carrying the distinctive red bags that signify the brand, leading researchers to the source of satisfaction The Chicago store was the brand's sole retail outlet until 2004, when American Girl Place in New York opened, a third flagship brand store was opened in 2006 in Los Angeles Smaller outlets have recently been added in Atlanta, Dallas, Boston, and Minneapolis, and the original Chicago store was significantly enlarged and relocated to Michigan Avenue's Water Tower Place in fall 2008

Transfixed by the symbolic world, cultural theories of brands and branding have only begun to scratch the surface of person–object interactions, and understanding brands' sociocultural nature has become a fundamental objective of contemporary consumer research The effort to achieve this objective has focused the attention of both academics (e g , Brown, Kozinets, and Sherry 2003, Holt 2004, Thompson, Rindfleisch, and Arsel 2006) and practitioners (e g , Atkins 2004, Wipperfurth 2005) on brands with legendary or cult status and the strong visceral element that characterizes consumers' experience of these brands Such work follows several other advances that have brought the symbolic nature of brands and their roles as relationship partners and cultural agents to the fore, marking a significant shift in the way marketers think about successful brands, brand relationships, and the effective management of brands

Although this shift was generated by and has paved the way for new knowledge about the social nature of powerful brands, this knowledge has accumulated in piecemeal fashion and is idiosyncratic, lacking coherence and integrity This is in part because all the cultural components and processes have not been studied within the same brand, making it difficult to close the loop and connect these interrelated elements In addition, powerful, emotionally resonant brands tend to be complex, the product of multiple creators authoring multiple representations in multiple venues The complexity of these brands is the source of their power, but it also renders them difficult to characterize completely and definitively They do not reside in any of their constituent parts, rather, they are products of the dynamic interactions between these parts and the system or gestalt they comprise Here, we use the term "gestalt" to imply "a 'shape', 'configuration', or 'structure' which as an object of perception forms a specific whole or unity incapable of expression simply in terms of its parts" (from the *Oxford English Dictionary*, 2d ed)

In a recent theoretical paper, Berthon and colleagues (2007) employ the three-worlds hypothesis of philosopher Karl Popper and a construct they call "brand manifold" to explicate their contention that twenty-first century brand management is vastly more complicated than it has ever been The authors assert that because today's brands have multiple meanings that vary over time and among a multitude of constituencies, brand stewards must effectively manage a "matrix of possibilities " The matrix, or "manifold," is conceptualized as a topological space or surface formed by a set of distributed points Berthon and colleagues posit that instead of mediating a dialogue between company and customer, brand managers must participate in a "multilogue" and attend to, and leverage, a "symphony" of old and new brand meanings

We concur with the notion that brands are represented by a multitude of meanings and that this has profound implications for effective brand management However, we argue that because all elements of the matrix, or manifold, are in continuous interaction with one another, the collection is best conceptualized as a system, or gestalt, within which the brand resides or from which it emerges To learn how the gestalt gives rise to the brand and to better understand the management challenge facing brand stewards, a single brand must be studied from beginning to end, from planning and execution through consumption by various audiences and constituencies Through this single brand–focused effort, the nature of both parts and whole may become known A viable brand epistemology requires the identification and study of as many of the brand's creators, representations, forms, and venues as possible, as well as an understanding of the complex interactions among these system components Although it is only as a result of such a multifaceted effort that the emergent properties of a brand system will reveal themselves, all brands are not equally amenable to such an effort

According to Brown (2005), the most compelling brands are those whose narratives are "multistoried stories"—that is, stories built on or nested within other stories These are more often entertainment brands, such as Harry Potter, Hello Kitty, and even Martha Stewart, than the consumer packaged goods and durables brands that spawned previous branding paradigms Because the United States constitutes what has been termed an "entertainment economy," Brown asserts that there is more of value to be learned about cultural branding from entertainment brands than from those residing on the shelves of supermarkets, drugstores, and mass-merchandise outlets

In this article, we attempt to close the loop on the interrelated findings in sociocultural branding research by examining meaning creation and utilization processes from start to finish among the many and varied adherents of a single entertainment brand Studying American Girl from the perspectives of its stewards and various publics in many of the locations in which the brand is manifest provides a more complete and holistic view of sociocultural branding Before describing our methodological approach, we summarize the findings and what we view as the limitations of some of the sociocultural branding work on which our own effort is based. We also briefly discuss research pertaining to children's understanding of brands.

Building on the work of Fournier (1998) and Muniz and O'Guinn (2001) on consumer–brand relationships and brand communities, McAlexander, Schouten, and Koenig (2002) spent time in locations where loyal consumers gathered to investigate the role of community in the creation and maintenance of brand loyalty. An important contribution of their work is the notion that both consumer–brand relationships and consumer–consumer–brand relationships, or brand communities, are situated within a relationship "mosaic" that also incorporates relationships between consumer and product and between consumer and marketer. The mosaic encompasses existing relationships (e.g., those among family members or between friends), as well as new ones, and continually shifts and expands. McAlexander, Schouten, and Koenig also highlight marketers' facilitative role in creating a context for community interaction and helping establish shared traditions and meanings. Because the focus of this study is on relationships and loyalty, however, its conceptualization of brand and implications for brand management are unclear. The brand constructed as a set of purely social experiences disconnected from its physical and intellectual/cultural/ideological moorings lacks explanatory power. More significantly, although facilitation of community interaction is a component of the marketer's role to which too little attention has been devoted, it is only one such component.

Kozinets and colleagues (2004) view themed flagship brand stores as spectacular environments, and they examine the interplay between consumer agency and marketer-created structure in such spaces. They discover that at ESPN Zone, far from being overwhelmed or coerced by the sign-rich context, consumers use the retail environment as a stage on which to perform, enthusiastically enacting the brand and cocreating the spectacle. Therefore, emplacement is reconceptualized as a shared endeavor, with the marketer ceding considerable freedom to consumers who use it to "work within the rules of play, to break other rules, and create new rules" (Kozinets et al. 2004, p. 668). While revealing of the power dynamics of consumer culture and the potential for playful use of retail spectacle by consumers to enact individual and brand identity, Kozinets and colleagues' study does not address the use of the brandscape to enhance intercustomer relationships or the ways coconstructed brand meanings are employed outside the "cathedral of consumption" (O'Guinn and Belk 1989).

Brown, Kozinets, and Sherry (2003) employ two recently reinvigorated brands—the Volkswagen Beetle and Star Wars—to shed light on the nature and value to consumers of retro brand meanings. Retro brands are those from historical periods that have been revived, modified to contemporary standards, and relaunched. Using a netnographic (Kozinets 2002) method and constructs from the literary critic Walter Benjamin, Brown, Kozinets, and Sherry demonstrate that retro brands are characterized by an appealing sense of authenticity through their tangible connection to the time and place in which they originally existed. Even more compelling is their allegorical content, didactic messages implicit in brand stories that "invoke and then offer resolutions for consumer states of moral conflict" (Brown, Kozinets, and Sherry 2003, p. 21) rooted in culture. Thus, retro brands have a paradoxical essence—their ability to satisfy the need for contemporary levels of design and performance while providing emotional reassurance by embodying the values and perceived simplicity and safety of earlier periods. Although Brown, Kozinets, and Sherry's work is informative, it does not elucidate the processes by which meaning-filled narratives are created, and it offers little about the people to whom these brands matter or the roles of ascribed brand meanings in their everyday lives.

These limitations are also evident in the work of Holt (2004), who further elucidates the cultural origins and significance of brand meanings and the ways they bind consumers to commercial entities. According to Holt, some brands create equity—and in the process acquire iconic status—by providing powerful imaginative constructions that help resolve cultural contradictions. Meanings associated with these iconic brands serve to eliminate felt tensions between societal ideals and people's day-to-day experiences, and they address the anxieties of a nation through myths or stories that affect the way people think about themselves and their lives. "[Iconic brands] operate as identity magnets, delivering myths that are precisely focused to address an acute contradiction in society. If the myth resonates, the brand accumulates followers" (Holt 2004, p. 149). This work demonstrates the importance of cultural insight in creating and sustaining extraordinarily compelling brands, but as with Brown, Kozinets, and Sherry (2003), Holt does not explore or describe the processes by which marketers create cultural myths and, more importantly, how consumers use these myths for purposes dictated by their individual life projects.

Holt and Thompson (2004) offer a more nuanced understanding of how consumers use culturally constructed meanings in their investigation of men's efforts to resolve a culturally rooted masculine identity crisis through consumption. They describe the ways branded goods and services are employed to help reconcile a pair of antithetical American masculinity models and how men use them to construct a version of masculine respect that has meaning and utility for them. However, as with Brown, Kozinets, and Sherry's (2003) and Holt's (2004) studies, Holt and Thompson's study reveals little about the original creation of meanings associated with the brands involved. In addition, because its focus is on the men rather than on the brands, implications for branding and brand management are difficult to discern.

Works by Kates (2004) and Martin, Schouten, and McAlexander (2006) explore the ways different social groups use marketer-created brand meanings to enhance group and individual identity projects. Kates explores brand cocreation among members of the gay community and identifies the ways brand meanings serve to "enhance and dramatize issues of interest and importance" (p. 462) to that subculture. He asserts that "collective action frames," or ways of interpreting and generating meanings within a community, serve to legitimate some brands and bind them to the group, these brands are incorporated into the community's collective memory and serve as repositories for interpretations of its shared past We agree with Kates's conclusion that brands are complex entities, and brand legitimacy may take as many forms as there are consumption communities However, we believe that this account of brands gives short shrift to the original creation of brand meanings and their roots in culture, a limitation shared by the work of Martin, Schouten, and McAlexander

Martin, Schouten, and McAlexander (2006) discover that women who ride Harley-Davidson motorcycles subvert the hypermasculinity that is integral to the brand, as well as female gender stereotypes, to create meanings that facilitate the forward movement of their individual identity projects The "outlaw mythos" that is foundational to the brand is used to "explore and expand" female riders' personal boundaries and their interpretations of femininity, while being transformed to suit individual and group purposes and needs Again, however, the original creation of the meanings co-opted by female members of the brand community is left to readers' imaginations

Taken together, the contributions of all the studies we reference strongly suggest the existence of something resembling the brand gestalt However, each study focuses on only one or two components, providing a less-than-complete picture and leaving open questions related to the way parts of the gestalt interact to produce an effect greater than any or all of them

Previously, we signaled our intent to discuss relevant research on children's understanding of brands Little is known about children and sociocultural branding or the coconstruction of brands by children Evidence exists that until late childhood, brands are understood in concrete terms, rooted in marketer presentation and direct experience Research by John (1999) and Achenreiner and John (2003) demonstrates that though seven- or eight-year-olds associate brand names with particular products and include them in requests, it is not until late childhood or early adolescence that children think abstractly about brands, attributing to them personality traits and associating them with constellations of user characteristics In addition, Chaplin and John's (2005) study of self–brand connections reveals that older children's accounts of the brand relationships depicted in their "Who am I?" collages rely on abstractions rather than on the concrete references typical of children several years younger These findings are consistent with the work of developmental theorists, including that of Piaget (1932, 1970), Kohlberg (1981), and Gilligan (1982)

The perspectives of these theorists vary in several aspects, but they are similar in that they assume the existence of cognitive structures—interpretive frameworks or unified systems of thinking—to which external events are assimilated and are themselves altered to accommodate new experiences Developmental change, which results from continuous reciprocal influence exerted by an inherently active organism and its environment, is characterized as progression through a series of stages A child's experience of the physical and social worlds is determined by his or her stage of cognitive development—that is, the cognitive structures he or she has evolved to that point In general, it is believed that not until late childhood do these structures enable understanding of others' perspectives and motivations or make abstract thought possible

In the following section, we discuss our methodological approach, we then describe what we learned about the American Girl brand from studying its history and its texts and material manifestations From there, we move to what we consider the cultural roots of the brand and the ways it is experienced by adult women and multigenerational female family units and by girls ages 7 to 12, who represent its primary customer target Finally, we discuss what we believe to be the implications of our work for theory and for managerial practice

Method: Ethnographic Procedure

To read the American Girl brand through its built environments, members of a multigendered, multigenerational, multinational, multiethnic, and multi-institutional research team deployed themselves inside, outside, and around Chicago's American Girl Place and the living spaces of Chicago-area brand devotees For more than three years, team members—often in pairs, but occasionally alone—shared the store environment and children's play spaces that house the brand with girls and their mothers and grandmothers Three of the researchers also spent time in the New York flagship store Data collection involved participant observation, ethnographic interview, photography, and videography, we obtained informed consent from all participants The field notes and transcripts generated by this effort constitute the data from which we draw interpretations

The primary objective of the ethnographic exploration was to understand the sources and uses of meanings assigned to the American Girl brand—that is, where, how, and by whom these meanings seem to have been originated and the locations in which and purposes to which they were used by the brand's constituents We believed that identification of the points of influence within the manifold or matrix (Berthon et al 2007) and description of that which was created and propagated at each point would yield a better understanding of the interactive properties of brand systems We suspect that the power of extraordinary brands resides in such interactions

With that end in mind, we designed our ethnographic approach to explore the multigenerational aspect of the brand Most frequently, the mother and grandmother were interviewed along with the young doll owner In-home ethnographic interviews ranged from two to three hours and typically included a tour of the doll owner's American Girl collection, as well as descriptions and demonstrations of modes of doll play These interviews were conducted by single or multiple team members and were often followed by trips to the store so that the researchers could shop with the girls in whose homes they had spent time Families encountered on Michigan Avenue buses—some visiting from as far away as New Jersey—and on the South Shore trains from Indiana were intercepted and interviewed on the spot, in their hotel rooms, or at the store Hours of unobtrusive in-store observation were logged, tea was taken at the café, and reviews of the American Girl play (*Circle of Friends*) were shared by girls in earnest after-theater discussions with their researcher/chaperones in nearby eating establishments. A visit to the American Girl Place offices for an interview with the store's marketing director, as well as less formal discussions with sales associates, provided a management perspective on the role of store ambience in the creation of consumption rituals and the emplacement of memory construction.

Members of the team immersed themselves in popular press articles about American Girl and read several of the historical narratives accompanying the dolls to ensure maximum familiarity with the brand. Each interview transcript, text, and retail experience was considered from the standpoint of the shared understanding of the brand phenomenon that prevailed at the time and also served to inform and evolve that provisional understanding. The whole research team met periodically to share experiences and impressions, to disseminate data, and to identify, discuss, and adapt relevant theoretical frames in drafting interpretations. Frequent e-mail communication facilitated the iterative sensemaking effort that took place between meetings.

Findings: Myriad Meanings

The American Girl brand shows evidence of much complexity, comprising a multitude of narratives that are both textual and textural. The former are literally printed in books that tell the stories of the dolls and conversation cards that sit on tables in the American Girl Café or are enacted from scripts, as in the musical revue that can be experienced at the American Girl Place theater or the made-for-television American Girl movies. The latter are embedded in the well-orchestrated material culture of the enterprise (merchandising and merchandise) and are recovered in reverie and (re)telling as consumers interact with product and components of the retail environment. If brands come to life through stories, this brand is animated, grows, and gains vigor through the multimedia chronicling of tales that are woven into the lives of its users and its large population of engaged fans. Our investigation yielded insight into a multiplicity of brand meanings from a variety of narrative sources: the culture at large, the founder's brand creation myth, the company's stewards, adult women, and the girls who represent the brand's primary target market and core franchise. As we show, constellations of meaning from these sources have different foci and, in many ways, are distinct from one another, yet all are easily accommodated by the brand. A broad focus capable of encompassing these multiple perspectives and the connections among them is critical to apprehending the American Girl brand gestalt.

In what follows, we chronicle the diverse meaning creation and utilization processes enacted by the many and varied adherents of this brand. We begin by detailing the cultural aspects of American Girl, including its intended meanings and cultural purpose. From there, we describe the ways these meanings are presented and enacted in the material environment of the American Girl retail locations. Next, we describe the coproduction and use of American Girl brand meanings by adult women and girls, as well as multigenerational female families. By encompassing all these perspectives, we provide a glimpse of the American Girl brand gestalt.

American Girl Brand Meanings and the Marketer

In his research on the influence of Walt Disney and his entertainment empire, Sammond (2005) studies a range of popular sociology books, child-rearing manuals, mainstream advertising, mass-culture theory, and Walt Disney motion pictures. He theorizes (p. 106) that rather than representing a commercial "colonization of childhood," the rise of the Walt Disney entertainment brand is linked to a simultaneous "national enterprise of producing normal children." According to Sammond, Disney's response to concerns about the negative and intertwined impacts of consumerism and the mass media on children was to position himself as a father figure to American children and the Disney offering as a kind of social salve to cultural problems.

Our perspective on American Girl has much in common with Sammond's (2005) view of Disney. Pleasant Rowland founded American Girl in Middleton, Wis. (a suburb of Madison) in 1985 to offer 3 historically situated American Girl dolls—a pioneer girl, a Victorian girl, and a Depression-era girl—each with her own story. Eventually, 10 more dolls were added. The result is a line of 13 fictional doll characters representing nine historical eras and several different ethnic groups. Each of the 9 main characters (4 of the primary protagonists have companions) has six novelettes relating episodes of her life story and a set of elaborately detailed and historically accurate items of doll clothing, accessories, and accoutrements.

The books' story lines address more or less universally relevant issues: maintaining supportive and loving relationships with families and friends, engendering trust, perseverance, and dealing with embarrassment and disappointment. As such, they are barely cloaked morality tales, each with a different ethnic and temporal/historical spin, a young girl's version of the Harlequin romance or "chick lit" (Chiu 2006) genre. Contemporary dolls are also offered, and girls are encouraged to choose a doll whose skin tone, hair color and type, and facial features are similar to their own from the Just Like You series. Girl of the Year contemporary doll characters have been introduced in recent years, one each January. They come complete with books, clothing, accessories, and furniture, all destined to disappear from stores and catalog the following December. In addition, the American Girl library offers junior etiquette and self-help primers with titles such as *Oops! The Manners Guide for Girls* and *A Smart Girl's Guide to Boys: Surviving Crushes, Staying True to Yourself, and Other Love Stuff*. The company publishes a bimonthly magazine titled *American Girl*, which it describes as "the age-appropriate alternative to teen magazines." These product lines receive no traditional advertising support, and marketing communication channels are limited to the catalogs, Web site, television films, and retail outlets.

From the beginning, Pleasant Rowland, who markets herself as carefully as Walt Disney did himself, represented the American Girl brand as moral salve for a culture whose conception of girlhood was often painfully at odds with girls'—and mothers'—day-to-day experience In a 2002 interview in *Fortune* magazine, she relates the birth story of the enterprise in the form of an epic tale squarely centered on its mother-creator The story commences with fertilization and gestation, as a visit to Colonial Williamsburg and the experience of failing to find an alternative to Cabbage Patch Kids and Barbie dolls as Christmas presents for her eight- and ten-year-old nieces "collide" and "the concept literally explode(s) in (her) brain" (Sloane 2002, p 70) She then describes a metaphorical miscarriage scare, the result of skepticism on the part of consumer focus group participants and direct marketing suppliers, and recounts the birthing, rapid growth, and ultimate adoption of the business by Mattel Inc From management's perspective, the key to the brand's success was the mixing of pleasurable fantasy play with education and morality

> "Chocolate cake with vitamins" is how Rowland describes the mélange of imagination, history, and values that characterized the brand She holds fast to her Midwestern morals in Pleasant Company's efforts to do right by little girls "Mothers were tired of the sexualization of little girls, tired of making children grow up too fast," says Rowland "They yearned for a product that would both capture their child's interest and allow little girls to be little girls for a little longer" (Sloane 2002, p 70)

Just as Sammond (2005) describes Disney as an unguent for parents, American Girl may be perceived as a protective shield for little girls against the precocious sexualization that is often blamed on consumer culture and, in particular, brand marketers (Quart 2003, Schor 2004) This ideological framing of the brand's meaning is essential to understanding aspects of its consumption, but "chocolate cake with vitamins" is only one element in the intricate story of this embodied brand

The result of Pleasant Rowland's efforts is a set of fictional girl doll characters, each revealed in six paperbound novelettes that link significant elements of the character's life in a sequential story arc The first book in the series invariably tells a story of the girl and her family, for example, *Meet Kirsten* (or Samantha or Molly), then, there is a story about school in *Kirsten Learns a Lesson*, *Kirsten's Surprise* is a Christmas story, *Happy Birthday Kirsten!* is a birthday story, *Kirsten Saves the Day* is an adventure tale set during the summer, and *Changes for Kirsten* is a story about overcoming adversity that is set during the winter Each book is 60–70 pages in length, contains four or five chapters, and is written at an eight- to ten-year-old reading level with pictures of the girl and her family and friends rendered in realistic colored line drawings A particular genius of the books is their portrayal of the girl/doll in several outfits and settings that evoke the historical period and lend an air of authenticity to the stories

The most visually compelling American Girl product line components are the 18-inch dolls, each intended to represent a "real girl" located within a particular part of the country and period in American history The dolls have a solid, substantial look and feel and have similar proportions to a school-aged child Skin tone as well as eye and hair color and style varies, but all the dolls share a visage that bespeaks intelligence and good humor These dolls and their elaborate and authentic accoutrements, including miniature but perfectly fabricated furnishings, doll clothing, and accessories, aid in the conceptualization and enactment of the historically rooted stories, which many believe represent the soul of the brand For example, Kirsten is situated in 1854 and is described as "a pioneer girl of strength and spirit" Addy shows courage because she and her mother escaped from slavery in 1864 Josefina, whose mother had died, found herself in New Mexico in 1824 learning to "preserve what was precious" while welcoming inevitable change Turn-of-the-century Samantha, characterized as a "bright Victorian beauty," displays kindness toward and concern for those less fortunate than herself Bespectacled, dark-haired Molly is "a lovable schemer and dreamer" whose resourcefulness helped her family survive the Great Depression These descriptions shed light on the nature of the fundamental American Girl innovation the pairing of more-or-less ordinary dolls with elaborate historical and personal stories that exemplify a well-defined set of values

Other sources of brand meaning are the universal and timeless themes represented by the books' story lines—relationships between girls and their parents, conflicts with friends, difficulty relating to members of the opposite sex, issues of class and race—to which almost any young girl can relate For example, *Kirsten Learns a Lesson* depicts the young Swedish immigrant as embarrassed by her lack of linguistic proficiency and being teased by other girls who are native English speakers The stories are engaging and present dilemmas or conflicts that reach a denouement in the books' final pages There are also larger, overarching issues pertaining to the life of a particular character that span all six of "her" books and are only resolved in the last one in the series An example is the absence of Molly's father, who is away from home fighting in World War II during most of the stories Each book is followed by a nonfiction section called "A Peek into the Past," which provides greater detail on the relevant historical period with photographs, illustrations, and additional text The books support the core objective of the brand, which is to "bring history alive and provide girls with role models" (Morgenson 1997, p 128) who enact morality and traditional values

As with retro brand meanings (Brown, Kozinetz, and Sherry 2003), those of American Girl derive some of their utility from the historical periods in which they originate American Girl can be characterized as old-fashioned without being old and thus can transcend (however temporarily) the generation gap between grandmother and mother, mother and daughter, and grandmother and granddaughter In addition, these historically derived brand meanings may help combat the tendency that Cushman (1990) notes of consumers to experience a sense of emptiness while seeking fulfillment in the moment This feeling of emptiness is reminiscent of what the cultural historian Gebser ([1949] 1991) calls "denaturing" (becoming disconnected from the natural world) and "deculturing" (losing skills, including storytelling, and artifacts that come to serve as substitutes for natural relationships) As a brand concept, American Girl can be viewed as lifting girls out of their historical moment, creating and providing access to a transcendent "reculturing" place and space that connects what they like to call "our" time with those in which the story characters lived

The American Girl brand also provides a set of cultural resources for women to deploy in the construction and transmission of a legitimized gender identity By offering scripts for the enactment of heroic femininity and templates for the replication and perpetuation of domesticity, the brand helps mitigate the effects of cultural contradictions surrounding the contemporary female role In addition, by facilitating and participating in what has been called "allomothering"—the provision of maternal nurturing to children by nonmothers—American Girl abets women's efforts to provide their daughters with the impeccable parenting portrayed by the culture as their birthright (see Sherry et al 2008)

American Girl may be viewed as having been created with the objective of mending tears in the cultural fabric that cause discomfort to women and girls The brand is intended to palliate the pain associated with cultural contradictions, such as those that Holt (2004) and Holt and Thompson (2004) describe, not through advertising but rather through the development and delivery of product and service experiences and narratives The impact of the Mattel ethos on the Rowland aura is yet to be fully realized However, the recent enactment of social dramas rooted in stakeholder concern about the marketer's representation of ethnic communities and labor management practices suggests that the brand's rampant growth is being read as incipient "Barbification" (Sherry et al 2008) If this is the case, the Mattel acquisition is as likely to hurt as to help American Girl

American Girl Brand Meanings and the Material Environment

The store Another pivotal element in the creation of this complex brand is the set of distinctive retail spaces in which it resides Our opening vignette describes Chicago's American Girl Place, the first flagship store, which draws enthusiastic hordes of girls and women inside through a revolving door and then deposits them back on the street carrying red bags containing artifacts from the world within

When inside, consumers find themselves on a landing—a threshold between worlds—mediated by a concierge who dispenses advice and summons sales floor assistants to facilitate the expedient location of product by harried parents Beyond, there is an elaborate bookshop, stocked with the cultural historical biographies that celebrate the signature dolls in the various lines (which are available for purchase immediately beneath the signage bearing their names) and the self-help books that proffer advice to young consumers negotiating the perils of girlhood Abutting the bookstore is a photographer's studio, in which the images of young consumers and their dolls are rendered as portraits and framed as American Girl magazine covers

From the escalator down to the basement floor, the walls of one room are lined with vitrines that display each American Girl doll and all her accessories in museal tableaux Consumers parade before the glass cases as if visiting a museum of natural history, pressing hands and faces against the displays and passing commentary on the contents In this particular sales area, the floor is carpeted in dark red, and baroque furniture is arrayed around the room in such a way as to create homey micro zones suggestive of parlors or drawing rooms Atmospheric settees, divans, and sociables (s-shaped couches that allow sitters to face one another) provide inviting perches for shoppers The other sales area on this level is lined with vitrines as well, but these are larger-scale dioramas that provide literal windows into life-sized interior worlds of the American Girl dolls' historical personae

The "up" escalator goes to the second story of American Girl Place and into the realm of American Girls of Today In an anteroom, the Girl of the Year doll is merchandised with accessories and books in a less museal way than her downstairs counterparts This anteroom also contains girl-sized clothing, jewelry, and line-extended paraphernalia, such as electronics and hair accessories, and abuts the largest, busiest, and most variegated sales floor in the building The magnificent midway on the second level is more dimly lit than the other sales areas, and its floor is padded with black carpet that muffles much of the ambient noise heard in the other rooms The midway comprises three principal zones and has several specialized sales rooms abutting it These rooms are boutiques, which feature the Bitty Babies and Angelina Ballerina lines, which are each uniquely accessorized and serve as gateway products into the American Girl/American Girl of Today franchises

As they leave the anteroom, consumers encounter an enormous glass case housing approximately two dozen Just Like You dolls dressed identically in the purple uniform of a private academy and posed in long rows as if on risers for what appears to be a class photograph The dolls vary phenotypically by skin, eye, and hair color, but they are morphologically indistinguishable Cards describing each doll type are attached to the case, so consumers can identify by text, as well as by sight, the exact physical makeup of the doll they desire Halfway down the corridor, a beauty salon for dolls occupies pride of place Surrounding the salon are numerous display cases of dolls wearing clothing and accessories from the mundane to the fantastic The walls of the entire corridor are lined from floor to ceiling with merchandise depicted in the display case The end of the midway is devoted to developmental self-care literature designed to prepare young girls for the passage into adolescence, to the doll hospital from which broken dolls are transshipped for repair, and to merchandise pickup and checkout registers

American Girl Place is a sensory and emotional juggernaut that hits women with surprising force Capitalizing on the "reflexivity within research" opportunity presented by ethnographic observation (Wallendorf and Brucks 1993, p 342), we captured the impressions and feelings of one member of our research team (a white, Italian, married woman with a son) on her first visit to the Chicago store We share these to convey the overwhelming nature of the American Girl Place experience

> My God! These are very beautiful things "Cute!" as Americans say I'm really impressed, surprised at the richness and the beauty of all of the things I see There are so many of these beautiful dolls with marvelous clothes and

> suits of different shapes and colors The main colors that they feature are the ones I loved when I was a child pink, light blue, orange, yellow, lilac, and fuchsia The colors of young girls, I would say The colors of joy, beauty, spring Each doll is wearing a very nice suit with any possible combination of accessories What impresses me immediately is the variety of dolls' shoes, slippers, bracelets, and bags They are perfect despite their small size They are even nicer than "real" shoes and slippers For a while, I'm not able to appreciate all the particulars because there are simply too many things to see Too much for my eyes and my mind I feel like a little girl under the Christmas tree and a bit shamefaced to show my feelings to my colleagues I'm literally overwhelmed It is unbelievable, you can't imagine how I feel without also seeing these dolls and their things "You can't imagine" is the expression I would use to tell others what I'm experiencing I've come to the shop without ever imagining that I would become so emotionally involved, have such a strong emotional reaction But I look in the faces of the other women here, and I can see a sort of wonderment and amazement also in their eyes Anyway, I'm not able to avoid expressing my feelings I would like to be a child and have the chance to buy something from this store to play with and take care of Even if I know that I wouldn't be able to choose a favorite thing It seems very difficult What I'm describing is not the surprise of the typical Italian tourist visiting a well-refurnished U S store with a rich and variegated products' offer My surprise is like being in the Toy Place of my childhood fables, like the one I experienced in Disneyland Paris in the dolls tunnel of "It's a Small World" or something like that I can remember that I felt emotions that reminded me of my childhood that drew me back enchantment, joy, airiness, happiness, and innocence These are the feelings and sensations I am living now These feelings remind me of the illusion and airiness of dreams, the possibility of building a beautiful world, and to imagine a painless and perfect life A life of beauty and wealth (Field note excerpt, April 26, 2003)

There is surprise and delight in this passage, tinged with nostalgia and wistfulness This researcher came to American Girl Place "without ever imagining that [she] would become so emotionally involved" and amazed herself—as well as all of us—with her strong reaction The source of that which overwhelmed her is no proto-American or mass-media unguent ideology Particularly obvious because of the cross-cultural context in play here (and the researcher's lack of a daughter to share these items with) is that these strong feeling are linked to the "very beautiful things" that work their magic first through the visual sense, a powerful gaze The dolls and their outfits and accessories are rich and elaborate, in different shapes and the colors of girlhood—colors of "joy, beauty, spring"—and all are "perfect, despite their small size"

As with other branded servicescapes, including Nike Town and ESPN Zone (Sherry 1998, Sherry et al 2004), American Girl Place serves as a repository of objects and experiences gathered from the outside world, bringing the "outside inside" However, as the following excerpt from our field notes illustrates, American Girl Place also extends itself out onto the street The "inside" is taken "outside" as mothers, daughters, and grandmothers appropriate façade affordances, sidewalk, and curb space for multifaceted devotional rituals (Miller 2001) that bind the matriliny ever more closely

> The store's window dressings lure audiences to the building, informing and entertaining passersby curious enough to stop Often, this window-shopping concludes with the snapping of photographs, first of the store displays, then of other features of the facade (signs, flags, etc), and finally of visitors themselves posed before the building Trophy photos and video are vehicles of memory creation to which the boulevard outside the vestibule of American Girl Place is devoted In front of the store, girls pose with bags Girls pose with dolls Dolls are posed with bags Intergenerational photos are perhaps most commonly snapped Daughters pose with mothers and dolls Granddaughters pose with mothers, grandmothers, and dolls A *communitas* of the midway emerges, which energizes (or enervates) shoppers entering or leaving the store Storefront photos and footage often end up in scrapbooks and home movies (themselves often carried on the journey) that document the pilgrimage from start to finish (Excerpt from research field notes)

These are not so easily dismissed as mere Kodak moments that become "McMemories" (Ebron 1999), because the many components of the shopping trip continually rehearse the sacred trust of domestic reproduction, which is reinforced over repeated trips and is further strengthened by the intergenerational transfer of material culture in the form of dolls, clothes, and books The brand can be viewed as rebar for the female descent group, fortifying the bridging and bonding that proves the lineage

The theater and café On the lower level of American Girl Place is the American Girl Theater, the site of an elaborate musical revue that is part morality tale, part Horatio Alger mythology, and part paean to nationalism According to the company's marketing material, the *American Girls Revue* was "written by Broadway playwrights" and seeks to bring "the stories of the American Girls characters to life" (http //www americangirl com/stores/experience_theater php#revue) The revue celebrates the coming of age of the brand's quintessential heroine in all her glorious diversity and embodies the American Girl ethos of overcoming challenges by staying true to oneself and one's values and building strong and lasting relationships with family and friends The play evokes powerful emotional responses among theatergoers, children are transfixed, and many adult audience members may be seen brushing away tears Thus dramatized, cultural biographies are further reinforced, becoming potent objects of contemplation for the matriliny, in turn provoking projection and introjection

On the second story of American Girl Place sits the American Girl Café The café fronts Chicago Avenue, affording patrons a view of the Magnificent Mile and a bank of American flags from the large dining-room windows Elegant, intimate tables replete with cantilevered doll chairs seat female family units and their dolls Birthday parties are held in this venue as well The formality of the setting gives young girls a glimpse of a more civil time and a foretaste of the refined events the future may hold for them In an amazing production of social interaction, conversation cards containing questions (e g , "Do you remember your first day of school?") designed to elicit family stories from the group sit in a box on the table Thus, girls are provided a template for getting to know their mothers and grandmothers as fellow girls whose experiences both define and transcend the specifics of their times Consider the following reflection of one informant

> They had these little conversation starters, and they ask you questions about like, "What's your goal?" "What was your best birthday party?" "Who's your favorite teacher?"—stuff like that They were in like a little present box, and you opened them up, and they were printed on little slips of paper and you picked one out [My favorite was] "What was your best birthday?" I said my second birthday because I had a Cinderella party, and everybody came dressed up in, like, fairytale costumes

This scripted enactment of intimacy, coupled with the sharing of a ceremonial meal, constitutes a powerful cross-generation bonding ritual that melds individual stories into family history and almost effortlessly evokes family identity, the family's "subjective sense of its own continuity over time" and its unique characteristics (Bennett, Wolin, and McAvity 1988, p 212) Aligned with female-relevant meanings, the American Girl brand both facilitates and participates in the creation of female family history and family identity (see Epp and Price 2008) The brand experience becomes, literally, of family value

Regardless of whether the conversation starter device is employed, tea in the café at American Girl Place is a memorable experience

> "Tammy" I've been to tea twice Once with my mother, my grandma, and myself and, of course, Molly [her doll] But the one I remember most was my friend was moving to Atlanta, and it was around my birthday, so I went to tea with my mom, my friend "Olivia," and I, and we went to tea because she was moving It was my birthday So it was like celebration and mourning

Miller (1998) makes clear that shopping is a means of expressing and revealing relationships with others Shopping resembles sacrifice, "an activity that constructs the divine as a desiring subject" (Miller 1998, p 148), and is motivated by a desire to engage with the "subject" Similarly, the purpose of shopping is less to buy things that the "subject" wants than to relate to the individual who wants the things At American Girl Place, shopping as engagement with others is manifest, this is the most spectacular of the (literal and figurative) spaces hosted by the brand in which grandmothers, mothers, daughters, and granddaughters (as well as ancillary sororal entities, such as aunts, sisters, and female friends) are invited to gather, converse with one another, and share memorable experiences choreographed by American Girl Women and girls stand together before the dioramas marveling at the realism and completeness of the depictions of past eras or gaze and point at the shelves and glass cases feeling vertigo engendered by the small size and seemingly impossible perfection of yet another outfit, set of accessories, or room of dollhouse-sized furnishings

The mediatized environment serves to validate grandmothers, who often function as the cruise directors and financiers of American Girl Place outings The eras in which the doll characters are supposed to have lived are those in which the grandmothers came of age or those during which their parents (the girls' great grandparents) were children Thus, the historical periods referenced help realize the grandmother, as well as female family members from past generations In addition, retail theater dramatizes the template for family building with which the grandmother is entrusted Recognizing an opportunity to immortalize herself, one grandmother accepts the brand's mandate to "make memories" at American Girl Place

> Well, I think grandparents parents, too, but especially grandparents like to create memories for the children and for the family, you know? And I just thought that this could be one of those memories for her I think it would make those things I remember of my childhood, you know the grown-ups and events in my life that, when I think back about, I like, you know, they're special, and I want to create that kind of event for her That she'd say, "I remember my grandmother, my Nanna "— she calls me Nanna—"My Nanna and my mom and I went to American Girl," and I just you know I think they're more important than things, is the feelings and the memories I mean, I remember it too, you know, but for her it's much more important

The American Girl brand is both marketscape and mindscape (Kozinets et al 2004, Sherry 1998) As a (meta)physical destination, the flagship stores encourage consumers to have a compelling experience of the mastery of rites of passage comprising heroic femininity, resulting in the transmission of a familial template for domesticity The lived experience of that mastery, the immediacy of the moment that being in the store encourages, is the marketscape payoff The memorability of that experience—that is, the ability to relive the experience in other venues (and the concomitant need to rekindle the memory by revisiting the store), such that the moment becomes unforgettable—is the more ethereal payoff of mindscape The importance of memory within the context of American Girl Place is implicit in the tagline mantra, "Café Theater Shops Memories," as it is in admonitions from management to the research team members not to "interfere with the creation of memories"

American Girl Place is a brandscape that, similar to ESPN Zone (Kozinets et al 2004), might be expected to dominate and constrain, but instead it seems to enable cocreation by consumers In this case, the emplaced enactment of gender and family binds consumers to the brand and enriches the experience of other consumers As McAlexander and colleagues (2002) show with brandfests sponsored by Jeep, the marketer hosts the community, facilitating the creation of new connections among members while reinforcing existing ones The marketer and the brand also enter the community, becoming nodes in the network of relationships connecting its members

American Girl Brand Meanings and Adult Women

American Girl provides mothers and grandmothers with what can be regarded as a model for the comportment of young girls and a manual for their socialization These commercially sourced aids to enculturation and instructions for transmuting and transmitting traditional values are gratefully received by female relatives charged with helping "tweenagers" negotiate the broken terrain of girlhood in a plural postmodern society To a significant extent, the American Girl stories represent vehicles for conveying values Although they have elaborate plotlines, they also reference and reinforce values, such as hard work, civility, politeness, attention to the needs of others, and respect for adults They are brand allegories, symbolic narratives or extended metaphors that provide instruction in the resolution of moral conflict For this reason, they are particularly useful to parents and other adults who willingly acknowledge their debt to the American Girl brand Consider the statement of one such informant

> "Leticia" I think that, you know, they study it in school, and I'm glad because I've read the books, and I think the books are good and they have a really good message, a message that I would like to teach ["Charlene" (her daughter)] And one of the books was about some poor girl who wasn't getting a good education, and Samantha was teaching her [long pause] and the prejudices that existed back then, and that Samantha didn't have those prejudices, and those are the kind of messages that I would like ["Charlene"] to have an understanding of and that she wrote They were talking about factories and things like that and gave the kids a better understanding of like, well, you know, the factory and production and the whole industrial revolution wasn't all it was cracked up to be There were these poor starving kids breathing in all this bad air and another whole aspect to that that I would like ["Charlene"] to know and understand The industrial revolution isn't everything it's cracked up to be It's not all about getting more money And so those kind of values that I see in the books I really appreciate

Important to "Leticia" is the authenticity and legitimacy of the stories, which help validate her own moral stance and aid her in communicating a more nuanced view of the historical period than she seems to believe will be propagated by the cultural authorities and institutions that have access to her daughter

Similarly, "Mary," a mother, provides her plans to read the American Girl books to her future granddaughter and the reason she holds the books, and the brand, in high esteem

> You know, we have read two books because [she laughs] ["Holly" (her daughter)] is too old now I'll bring them to my granddaughter So I read the books myself because, you know, like there are so many negative things out there, and so much violence These books are just good values, you know, how to be kind, how to be honest, how to work hard, and these kind of things

"Mary" views the books as providing a counterweight to popular culture's negativity and violence by referencing timeless virtues, such as kindness and honesty

The elaborate and extensive nature of the American Girl product line creates endless opportunity for female relatives to pore together over the catalog or Web site A mother having tea at American Girl Place with her daughter "Amalia" and her own mother (the girl's grandmother) noted the following

> We like the catalog, and we get it every month Wish we had this, and wish we had that you know, so we've been talking about this for six months, that we were gonna take "Amalia" to Chicago [American Girl Place] for her birthday We all got so excited looking forward to it

The use of "we" is not incidental, the female kinship unit is foregrounded in many discussions about American Girl product wants and needs, and group excursions to American Girl Place often originate with family forays through the catalogs These weekend, birthday, or holiday excursions create occasions to share memories and reinforce intergenerational connections while having tea in the café or gathered before the store's historical dioramas Members of the research team witnessed more than one mother explaining to a young girl that the bicycle or desk in the display was much like the one her grandmother or great grandmother owned and that those female relatives had come of age during the era in which a particular doll character's story took place

Female kinship groups also find powerful cultural material in the American Girl brand with which to construct themselves as a family The complex brand narratives girls, mothers, and grandmothers use to author their own stories facilitate the creation of family mythologies that represent a synthesis of the commercial and the personal Stories from the dolls' books are interwoven with those from the lives of the daughter, mother, and grandmother and are used to support family oral history projects and create a shared understanding of collective identity Plager (1999) calls this "family legacy," an aspect of people's "lifeworlds" that connects them with other family members and the kinship group's past, present, and possible futures Family legacy is "lived understanding" of personal and family identity constituted through conversation with family-of-origin members, extended family, and members of previous generations The contribution of American Girl to a tween's understanding of the context in which previous generations of her family lived is deeply appreciated, as the following comments from a grandmother attest

> Well it's empowering with, you know, to have a girl shop like this, and the dolls are all of different time period in life, like Samantha is from 1904, and so all her books tell us how life was lived back then and answers where girls learn how it was back in the old days Well it seems like you are connecting with the past, past me [she touches her breast with the open hand, pointing to her identity/soul/personal story/experience], past my generation, you know, cause I'm 66, you know, and I don't know what it was like to live back in 1904, but these books are pretty true to what I've heard my mother tell about her life She grew up in the 1910 era, so for that and then, you know, there are different ones around here [she points to the windows of American Girls collection, Samantha and Addy, which are close to us], just look around here Addy and so she was born during the Civil War, you know, so there are all kind of, and Kirsten is 1854, and Josephina is 1824, so you know how the Hispanics lived about that time There are stories about that, so I just think that it's good for girls, to know all that of women

The brand also serves as a stimulus to the playful reconstruction of family history One of the girls, "Lisa," pointed out a photograph of her family dressed in Civil War–period costumes that sat on a shelf in her home In the photograph, she wears an outfit identical to that of the Addy doll she holds in her arms "Lisa" described the events of the day on which the photograph had been taken, and her mother, "Donna," brought into the room a homemade holiday card that bore this photograph on its cover "Donna" rose from her chair to deliver a dramatic reading of the story printed inside the card, which commingled the historical and contemporary and the real and imagined.

> Okay. December 1865. Dear family and friends, Back in 1864, whispers of freedom spread through the Miller plantation, where even though the risks were high, the family's future was set free by escaping to the Promised Land. Papa Tim went first because he grew tired of being the jester and performing his minstrel show for the master. Now in Chicago, he is learning to read and hopes to go to school next year. Big brother Carl was sold away to the plantation, many miles to the south. We miss him terribly, but now that we are free, he comes to visit on the weekend. Sister Lisa is now five years old and is growing so fast. She is going to school for freed children and loves to draw and write her letters. She was brave that night when we led her into the woods on that journey north to freedom. I could no longer stand to see my family members beaten and sold away. We left baby Garret in the care of the elders, but kept our promise to come back for him. He is now one and loves to play with his spelling blocks. He is also walking now. On April 19, 1865, the Civil War ended and there was much rejoicing in the street. Cannons and guns were fired. We all were celebrating. Unfortunately, the same sounds but with sour occurred a week later after President Lincoln was shot on Friday, April 14, 1865, and died the next morning. With God's grace, we are fortunate as former slaves to have reunited our family. Earning a living and building a new life is a struggle, but with the warmth of family love, we will survive. We are now getting ready for Jubilee Celebration on January 1st as we celebrate the Emancipation Proclamation that was issued by President Lincoln on January 1st, 1863. We face the future with hope and prayers that our grandchildren and our great grandchildren will remember the struggle and know that love for God, yourself, and your family, and your fellow man will see you through. Love always, "Donna Caldwell," Chicago, IL

Commenting on the way she had drawn from the Addy story and her own and family members' lives to create the saga she shared with family and friends, "Lisa's" mother remarked,

> This is funny because basically I took tidbits of our real life in 2000. And, um, like our "big brother Carl" lives out south with his parents, and he comes to see us on the weekend. And "Tim," my husband, is definitely a class clown, so he grew up being that way, and "Lisa" was learning to read. So it all came from Addy doll and reading the Addy books. And that's where it generated from.

Coconstruction and reconstruction of family stories from material provided by the brand was common, and appropriation and reinterpretation of story elements by several adult members of a single family produced new combinations of the commercial and the personal, each of which was imbued with shared meaning.

American Girl Brand Meanings and Girls

With female parents' and grandparents' affinity for the brand's traditional values and their connection with its historical renderings firmly established, we now turn our attention to the relationships of the girls with the brand through its stories, artifacts, and retail presence. Observing hours of play and conducting in-home and in-store interviews with more than a dozen girls who were devoted to their American Girl dolls, we develop a picture of American Girl brand consumption that is consistent with principles of cognitive and moral development (Gilligan 1982; Kohlberg 1981; Piaget 1932, 1970).

We find that older girls (ages ten and above) seem to grasp the abstract relational meanings conveyed by the brand's many stories. Others, frequently younger girls, construct a "reality-lite," which concretizes abstract issues and glosses over moral dilemmas. These girls capture aspects of the historically based stories that parallel their own lives or fixate on details they find interesting or appealing but that ultimately lack significance. The following interview with "Olivia," a ten-year-old middle-class Caucasian girl whose grandmother indulges her with American Girl products, is instructive:

> Interviewer: [Holds up a doll] Can you tell me what you know about her story, the story of this doll? Did you read the book?
>
> "Olivia": Uh-huh. Yeah, I've read the first three. I didn't get the others. Kit lived in the depression, and her family turned their house into a boarding house when her father lost his job. And her father paid the workers before their company went bankrupt with his own personal money. So that's—they got really poor. And so she meets up with, she's like, she's really outdoorsy and what they'd call a tomboy. That's one way of putting it. And then like one Christmas her family was so poor they couldn't pay the electric bill, so they couldn't have any lights, and she had to work for her uncle. I forgot why. I don't know. I think he was sick. And so she did everything for him. And so when she was taking his shoes to be shined, the shoe-shining place was closed until the depression was over, and that's what the sign said, and so she did it herself. And it was only ten cents then, but that was a lot. So her uncle paid her because she did a really good job. And so she did all the work instead of taking it to the places for it to be done and earned up enough money for Christmas.
>
> Interviewer: Do you think that her life is so different from your personal experience? Your Christmas is different from hers?
>
> "Olivia": Well, kinda yes, kinda no. Because I think the basics of her life were the same as mine. It's just the little details, like I don't think we're having too much of a depression right now, and everything's a lot more expensive. Like the electric bill then was only $2.10. I think it's a little more now.

"Olivia" recounts events and key details of the stories: Kit's father lost his business, the electricity was cut off, Kit had to go to work. She applies some categorical labels: The family was poor, Kit was a tomboy, ten cents was a lot of money at that time. "Olivia" also seems to recognize the significance of Kit's father's treatment of employees after his company declared bankruptcy. However, her response to the request that she compare Kit's life to her own is revealing. It seems largely beyond her capacity to make the hermeneutic comparisons the interviewer anticipated or to apprehend and articulate the values for which the stories and the brand itself have been lauded by so many mothers. She views her comfortable, upper-middle-class life as essentially the same as that of a nine-year-old impoverished Cincinnati girl who lived during the Depression and had to go to work to help feed her family. The major differences she cites between the character's life and her own are "little details," such as the cost of electricity A similar but age-appropriate pattern begins to emerge in our interview with younger "Jessica," a seven-year-old upper-middle-class girl of mixed race

> Interviewer Did she (Molly) live in this time, in our time?
>
> "Jessica" She lived in a different time
>
> Interviewer And what time was that? Can you talk about that time?
>
> "Jessica" Yeah I can, um, that time when, how you'd make ice cream is very different than you'd make it now, and when you'd wear a dress, it would look very pretty, like this one that you'd wear on special occasions that would just be a dress On fancy occasions, you would wear something very fancy, and you know those hats that would curve they had back then
>
> Interviewer So it was a more formal time?
>
> "Jessica" Yes Where sipping tea meant you had to have cookies on your plate, and you'd go like this [She moves her hands in the motion of sipping tea in a delicate manner]

The American Girl character Molly is a nine-year-old who lived in 1944, during World War II When asked about her story, "Jessica" does not speak about the war, Molly's mother's struggles as one of many women raising children alone, or Molly's and her mother's constant concern that her father may be killed, concepts that are beyond the grasp of a typical seven-year-old, instead, she speaks of ice cream For "Jessica," younger and likely in the preoperational, or early operational (Piaget 1970), or preconventional (Gilligan 1982, Kohlberg 1981) stage, the most salient distinction drawn between 1944 and the current time is that "the ice cream is very different" In addition, she describes girls and women as having pretty dresses and curved hats and sipping tea with cookies As with "Olivia's" rendering of a different story, "Jessica's" focus is on details rather than on underlying meanings or moral issues that might serve to illuminate her own life Both, however, emphasize relationships among people and view objects as context for situations that involve girls similar to themselves and others who play important roles in their lives (Gilligan 1982)

In contrast, older girls made higher-level comparisons and found inspiration in the stories Two ten-year-olds, "Becca" (mixed race, middle-class) and "Tammy" (Caucasian, middle-class), demonstrate in the following accounts their ability to apprehend and relate to some of the broader ethical issues addressed in the historical narratives

> "Becca" I think it's because they [the doll characters] are somebody we can look up to, because a lot of their stories are inspiring Well, they are to me I don't know about everybody else, but they are to me 'Cause, like Kit, she had to live through some really hard times, and Samantha's parents had died So they both have like different issues that they had to deal with that were probably very hard to deal with, but they were able to live happy lives
>
> "Tammy" Felicity, she's—her time period is the Revolutionary War, and she has to grow—well, her grandfather's on the side of the king, and she's not, so she has to be appropriate for her grandfather, she has to like live up to those standards Then, she learns that she would really like to live up to her own standards

The life lessons implicit in the Felicity and Samantha stories are evident to "Becca" and "Tammy" Even the younger informant, "Jessica," is able to draw direct parallels from a story about overcoming adversity to unusually difficult challenges she is facing in her own life

> She [Molly] was on a boat in Girl Scouts because she was trying to get back, you know you go canoeing in Girl Scouts—well, she would, you know—and she lost the oars and she's on her sailboat, you know, and she's trying to get back, the water was just rushing and the water was pouring, and she has glasses She is just trying to get back to camp, and it takes like, I don't know how many hours it would take in the book, but it would take, like, two or three hours just for her to get back in the book

When "Jessica" was asked whether anything comparable had ever happen to her, she was immediately able to draw parallels between this chapter of Molly's story and components of her own life narrative After describing the time her family was at a restaurant that was robbed at gunpoint, "Jessica" explained the connection between that experience and the one Molly endured on the boat

> Well, you think you're scared, and you think you might die or something, but, because you're kind of locked up and can't get out, because, you know, there might be something out there or something, like she couldn't get out of the boat You get back and you think that you've died, but you don't really die, it's kind of similar like that because Molly probably thought that she was going to die on that boat, because, you know, usually you do, you fall out

On the subject of her parents' divorce, "Jessica" commented,

> Well, I wish that I didn't get in it I wish my parents didn't do it, like Molly wished that she hadn't gotten on the boat 'cause it wouldn't happen I wish that I just didn't have to go to counselors and stuff, and it's like I'm really tied up in something I don't want to do, and I never wanted to do it because I didn't even know it would happen I can't stop it because it wasn't my choice

"Jessica's" understanding of how Molly triumphed over adversity on the boat became intertwined with her own life narrative Her engagement with the American Girl brand, through the Molly doll and story character, provided perspective on the challenges she faced

It is evident from these vignettes that there is great variation in the girls' ability to use the stories to illuminate their own lives and facilitate the performance of life tasks Differences in the degree to which the girls extrapolated from particulars to more abstract and broadly significant meanings and the extent to which they evidenced concern for others seemed to reflect their respective stages of cognitive and moral development As may be the case with "vitamins"—Pleasant Rowland's favorite metaphor for the values that permeate the brand—efficacy depends on the administration of the appropriate dosage in the correct form at the right time The dolls and their stories are conceived as antidotes to premature ripening, but intended meanings may be missed or uniquely constructed if girls are not developmentally ready to receive them

The books, dolls, clothing, and accoutrements are designed to provide girls with a wide range of options for imaginative play The expectation is that girls will link their fantasy manipulation of the historical characters to a domestic reality with which they are familiar In the following interview with two seven-year-old, upper-middle-class Caucasian girls, "Maggie" and "Meghan," we inquired about imaginative play with their American Girl dolls

> Interviewer Can you give me an example of a story that you made up about your doll's time?
>
> "Maggie" Like once, Samantha—her Mom and Dad died when she was three years old, so her grandmother who was very, very rich—she sent Samantha to school And she hoped Samantha would be a proper lady, but she likes to climb trees and she ripped her tights, so she's a pretty adventurous, but her uncle and her—I can't—what's her name?
>
> "Meghan" Which one are you talking about?
>
> "Maggie" With the two sisters Well—well the uncle—he was thinking about marrying her [Samantha] and Samantha was thinking about they get married and she was correct, and so she has two younger sisters that—she's a grown-up, but she has two younger sisters who are about Samantha's age and so Samantha and they—both of them were in "Happy Birthday, Samantha" and "Samantha Saves the Day," and that's pretty much it

The story told by "Maggie" and "Meghan" does not deviate significantly from the one contained in Samantha's books Other girls invent and enact stories that have little to do with the historical periods in which the doll characters live When "Becca," age ten, spends time with her friend "Tammy," the girls often disregard the stories in the books and act out situations that replicate stereotypical female roles "We usually make up our own stories, me and ["Tammy"], like they're usually our daughters, and we have various jobs So like sometimes we're artists, and then they [the dolls] like judge our paintings and help us And like sometimes we're hairdressers or spa people, and then we do their hair all fancy ways"

Stories aside, a home visit to a young collector involves viewing, touching, admiring, and discussing a proliferation of dolls, clothes, and tiny and detailed household items—lots of "stuff" We observed that the girls' main activities were dressing and undressing the dolls, managing their (often vast) wardrobes and sets of accessories, and brushing and styling their hair The doll play we observed was very tactile and visual, much of the fingering and stroking appeared ritualistic, designed to soothe and relax rather than to stimulate thought or imagination Some actions by the girls clearly recapitulated behaviors evidenced by their own mothers and other caring adults, though much dressing and undressing was designed to prepare the doll characters for particular chapters of their life stories ("She's going apple picking today") Even when the time for reading the books and enacting the stories has passed, girls continue to touch and groom their dolls "Angie," a 12-year-old Caucasian girl and the eldest of three sisters in a family with nine American Girl dolls, relegated hers to a closet shelf, separate from the family play area

> I don't play with them anymore, but sometimes I get them down to change their clothes and brush their hair I'll never give them up [despite the pleas from her younger sisters] They are part of me They are in me [points to her heart]

The American Girl product line is marketed as a set of tools for creative play that is designed to teach values Our in-home observations make it clear that only sometimes are girls using doll play to absorb the finer moral and ethical points of the American Girl stories Left to their own devices, most of the girls reenact stories from the books quite literally, make up stories that have little to do with the characters in the books, or simply engage in tactile manipulation of the dolls themselves and their clothing, accessories, and accoutrements From these observations and the data on girls' readings of the American Girl narratives, we would conclude that the values pervading the stories are apprehended and appreciated by mothers, grandmothers, and other interested adults to a far greater extent than by the girls

As with the subcultures that Kates (2004) and Martin, Schouten, and McAlexander (2006) reference, women and girls of various ages use marketer-provided brand meanings in original or transmuted versions in their own ways to suit their own purposes and further their own life projects and agendas The marketer and brand serve as partners to adult women charged with enculturating young girls or intent on creating or recreating female family Older girls abstract from the brand narratives lessons they find useful in dealing with life's challenges, while those a few years younger enjoy the literal enactment of these stories or derive pleasure from touching, holding, and dressing the dolls

Conclusions and Managerial Implications

This article suggests that powerful brands are the products of multiple sources authoring multiple narrative representations in multiple venues A brand is the product of dynamic interaction among all those components—a continually evolving, emergent phenomenon, best studied in its totality Our research on American Girl reveals a network of meanings that are rooted in narrative and distributed among the brand's many constituencies It supports and extends Berthon and colleagues' (2007) brand manifold construct and helps address some of the gaps in understanding of brands and brand management that Keller and Lehmann (2006) identify in their article geared to the needs of managers It is particularly relevant to what these authors characterize as unanswered research questions pertaining to consistency versus complementarity of brand meanings and messages and those related to the experiential components of brand equity that are controlled by the marketer

The notion that the "sources and uses" of brand meanings are many and varied, as are the contexts within which they are created and enacted, is hardly new Nor is the idea that understandings of a brand by various constituencies are interrelated both because they are rooted in a common culture and because they have the opportunity to influence one another in myriad ways Indeed, the field seems to have been moving inexorably toward something resembling the brand gestalt construct for the past two decades However, as each aspect of the brand gestalt has been revealed, another has been obscured, it has been difficult to apprehend the whole phenomenon and to translate the expanding knowledge of brands into intelligible direction for those charged with managing them

The brand gestalt is both an epistemological tool and a representation of brand content It guides the acquisition of brand knowledge by serving as a reminder of all that must be investigated to contend credibly that a brand is known In addition, if we can describe in detail the component parts of a particular brand and elucidate the relationships among them, we have reason to believe that its essential nature has been captured and that the brand can be managed effectively Because interactions among the parts are critical to knowing the brand, insight into only some components is inadequate for prescribing effective action on the brand's behalf If what is not known cannot be managed, the value of the brand gestalt is incalculable

The brand gestalt embodies the notion that it is not one but a combination of elements, and the reciprocal influences among them, that best explains the power of brands Extraordinarily powerful brands may not be either those with the greatest number of positive associations or those with the most compelling identity myths They may not be the brands with the largest and most interactive communities or those that provide spectacular retail environments with the most opportunities for emplaced cocreation They may instead be brands whose components evidence the greatest degree of synergy and whose constituent parts best complement and enhance one another The brand gestalt encourages us to take a broader and more encompassing view of branding and brand management If brands represent symphonies of meaning, managers must be viewed as orchestrators and conductors, as well as composers, whose role is to coordinate and synchronize as well as to create

The American Girl brand offers a valuable lesson in managing complexity With the emergence of the narrative view of the brand (Brown, Kozinets, and Sherry 2003, Sherry 2005), and a reader–response view of the consumer (Scott 1994, Stern 1993), comes the prospect of the balkanization of experience and the emergence of consensus communities (Kozinets 2002, Muniz and O'Guinn 2001) that interpret the marketer's offering in unimaginably varied ways In the case of American Girl, each doll embodies a story, every book invites sociocultural or autobiographical reverie, and every aspect of merchandising in themed flagship brand stores encourages the enactment of gender roles and the performance and recovery of divergent familial histories The marketing organization itself is imbricated in ethnicity and gender identity politics on a media stage This multistoried brand is less a matryoshka with tidily nested identical entities than a disorderly aggregation of complementary and contradictory accounts, filled with ambiguities that consumers are driven to resolve and lacunae they are compelled to fill These personal narratives are then redacted, recirculated, and replayed The brand depends for its vitality and longevity on its constant reanimation by the cultural context in which it engages stakeholders and by the stakeholders themselves Rather than avoiding complexity, the brand thrives on it

What our research findings imply, along with those of other investigators, is that the brand is located within a complex system Influences exerted by the components of this system are probabilistic and reciprocal rather than linear and causal, therefore, it is impossible to determine where the brand's creation begins and ends The production of the brand can be understood to originate with the development by the marketer of a positioning, an offering, a set of marketing communications, and often a place (brandscape) in which its essence is intended to reside It might also be contended that what seems to be created by the marketer is actually rooted in, as well as ultimately contextualized and given meaning by, the cultural milieu In other words, the brand's creation is instigated and framed by cultural themes and trends and tears in the cultural fabric Alternatively, it could be said that the brand is created, or at least meaningfully recreated, through its use in the achievement of individual consumer identity and life project objectives, as well as the identity projects of a multitude of distinct consumer groups No matter where and how the creation process is assumed to commence, the evolved brand ultimately becomes a component of the system from which its next incarnation will spring

Our work also bears on two other issues pertaining to the authorship of brand content, the first of which is the origins of marketer-contributed meaning Brands have long borrowed from other sources to create their images and expressive content, popular songs, movies, and art all have been plundered for brand-building purposes, with brands appropriating meanings that seem to resonate with consumers and prove useful in their individual and group identity work In the branding future that Holt (2002) envisions, such practices will no longer be possible He argues that as consumers become savvier and more demanding in their consumption and deployment of meaning, brands will no longer be permitted to simply repackage and repurpose cultural content from other sources They will need to become cultural creators in their own right, producing original content that is meaningful to target consumers and relevant to their sovereign identity projects The American Girl brand exemplifies this approach From hiring established writers to author the characters' canons to the elaborate choreography of the Broadway-style plays and the spinning of the compelling, almost mythical backstory about its birth, the American Girl brand has consistently originated its own substantive content As an original producer of cultural meaning, it may be viewed as a prototypical "future brand"

Our work addresses a second authorship issue that is relevant to the future of brands Pitt and colleagues (2006) develop a typology of brand aspects—physical, textual, meaning, and experiential, each of which can be "closed" in the sense that content can be authored only by the firm or "open" in that all brand stakeholders have access to the means of creation Open source (OS) implies that "power and control are radically decentralized and heterarchical, producers and consumers coalesce into 'prosumers'" (Pitt et al 2006, p 118), and the value of the brand to users is significantly greater than to owners The OS state is one in which only a few brands (e g , Linux, Wikipedia) exist today but toward which Pitt and colleagues contend the majority of brands are moving Though attractive to marketers intent on increasing the value of their brands to consumers—and deepening consumers' involvement with those brands—the OS agenda is characterized by a loss of control for which many firms may be ill-prepared Pitt and colleagues propose a research agenda to illuminate further the OS end state and the evolution of brands toward that state over time In detailing this research agenda, they specifically reference the meanings assigned by various stakeholder groups to OS brands and brands moving along a trajectory toward OS Because American Girl evidences the sharing of authorship and ownership typical of OS brands, our investigation sheds light on some of the OS research issues that Pitt and colleagues identify For example, it suggests that marketers can retain a significant degree of control while choreographing coauthorship opportunities and that all four aspects of a brand—physical, textual, meaning, and experience—can be "opened" to consumer input, thus enhancing consumer value, while primary brand ownership remains with the corporation and value to the corporate owner is undiminished

A close reading of the American Girl brand suggests several additional managerial implications, which we frame in terms of our brand gestalt construct A product may become more successful to the extent that its customer manifestation is not merely an embodiment of functional or expressive satisfactions It may comprise search (e g , in the form of devotional ritual), acquisition (e g , in the form of edutainment), and disposition (e g , in the form of maintenance services or of bequest), as well as use, in its effectual engagement with customers A customer does not merely "buy," "have," or "use" an American Girl doll, she is caught up in a mesh of interwoven experiences, some engineered by marketers and others improvised by stakeholders, at every touchpoint of the brand Attention to stakeholders further suggests a target-plus strategy that not only attracts consumers in terms of transition to and from the expected segment (in this case, gateway opportunities for girls entering and leaving the "tweener" market) but also attracts guardians charged with overseeing these transitions (again, in our case, intergenerational relatives who may act as custodians and curators) Finally, the challenge of colonizing what might seem to be disparate realms of experience—the extension of the American Girl brand's essence into theme parks and even colleges (Twitchell 2004) is neither implausible nor improbable—must engage the marketing imagination

Implications for promotion and price are latent in our findings and are reasonably straightforward Proliferation of authentic touchpoints and facilitation of stakeholder interaction set the stage for the amplified word of mouth that is so essential to sustaining the cult or elevated status of a brand To the extent that a product is imbued with drama and can evoke performance, it carries the seeds of its own promotion, and evangelists will proselytize in its name A masstige pricing strategy in an era of mass affluence is especially effective when customers realize that they are actually paying for the product plus experience cubed the stuff, the setting, and the solidarity with community that consumption affords Buttressing this strategy with opportunities to trade up (Silverstein and Fiske 2003) and treasure hunt (Silverstein and Butman 2006) by providing price points to suit the nature of any visit occasion (ritual, either ceremonial or mundane) is also appropriate

Place is perhaps the most obvious mix element to yield managerial implications The semiotic intensity (Sherry 1998) of a servicescape depends on how tightly the dialectics of structure (formal/informal) and function (economic/festive) are simultaneously compacted The tighter the compression, the more energized are the shoppers American Girl Place is at once a shrine and a dwelling, it is commercial space and domestic space The American Girl brand is both a host and a guest, facilitating the making of families even as it joins them as a member The brand can be understood as an archetypal parent, bridging and bonding generations To the extent that retail outlets emplace a brand, permitting consumers to experience its psychosocial essence, they will introject that essence, allowing the brand to dwell in them

As ethnographers, we acknowledge the excitement underlying the ostensible discovery and celebration of the experience "economy" (Pine and Gilmore 1999) and the experience "culture" (Schmitt, Rogers, and Vrostos 2004) that has swept the field of marketing We also recognize that consumer culture theorists have a long tradition of inquiry into the experiential dimensions of marketplace behavior (Levy 1978) From early foundational arguments for its pervasiveness (Hirschman and Holbrook 1982, Holbrook and Hirschman 1982) to contemporary exhortations for its resurrection (Thompson, Locander, and Pollio 1989, Zaltman 1997), the importance of experience in understanding consumer behavior and guiding managerial decisions has been granted

Happily, the increased deployment of qualitative research methods, especially into extraeconomic aspects of consumption and marketing, has coincided with an era that has witnessed the apotheosis of commercial spectacle A consequence of this phenomenon has been the proliferation of studies into immersive experience (for genealogies and examples, see Belk and Sherry 2007) Dramaturgical analyses have become a staple in the consumer culture theory tradition (Giesler 2008, Sherry 1991), and the servicescape literature in particular has explored the phenomenon of retail theater with increasing sophistication To the extent that theater is at the heart of the genre of spectacle that brands such as American Girl embody, its viability is highly contingent Marketers must continue to engage consumers with refreshed scripts, props, and stages of sociohistorical value that resonate with contemporary concerns Consumers must find the recovery and enactment of relevant cultural values compelling enough to warrant their continued investment of imagination (not to mention money) over and against the claims of other entertainment genres on their attention

Going beyond the discipline's four Ps framework and its many elaborations, we offer the observation that a brand such as American Girl is a cultural cynosure, an object of focal fascination and contemplation by virtue of its resonance with norms, values, and mores Because a culture's key identity issues are always under construction and in active negotiation, such a cynosure is a site of contestation The brand acts as both a lightning rod and a fault line for contemporary cultural debate American Girl has already demonstrated its ability to antagonize and befriend consumers along the lines of ethnicity and religion, as a result of unanticipated and unintended consequences of managerial decisions (Sherry 2005) Marketers must recall that they are often managing political, not merely commercial, properties and cast their decisions in a broader theater of influence The brand is always a narrative, even if it is also a cycle, cluster, or canon—that is, polysemous and antiphonal in character, requiring careful attention to all its stakeholders

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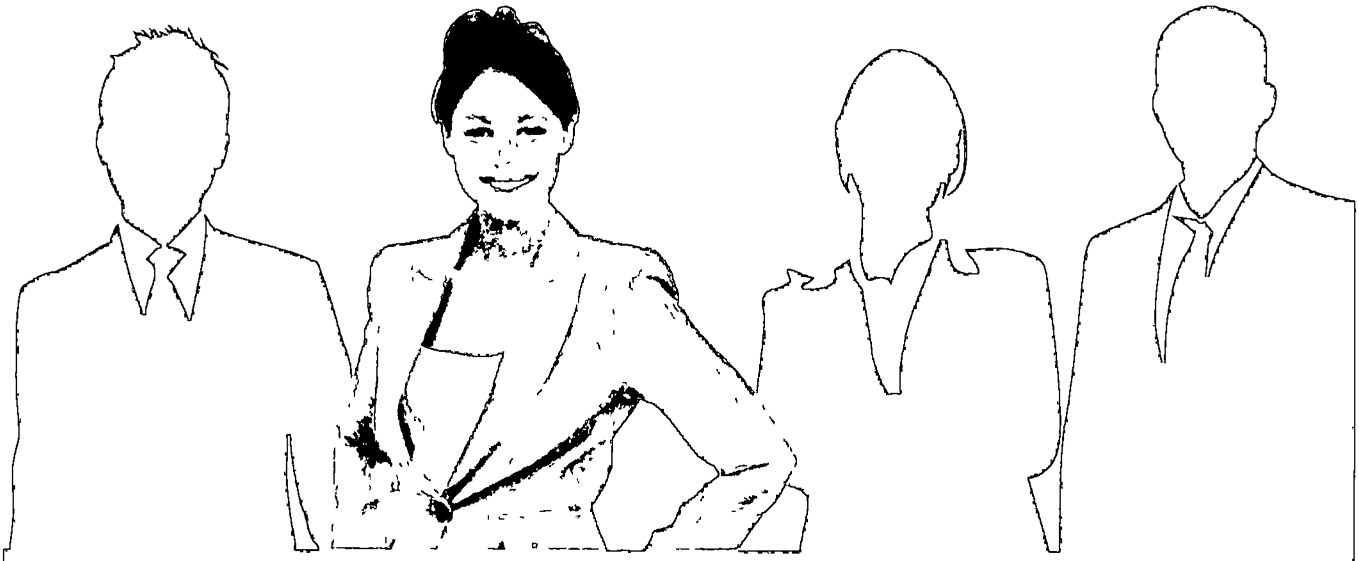

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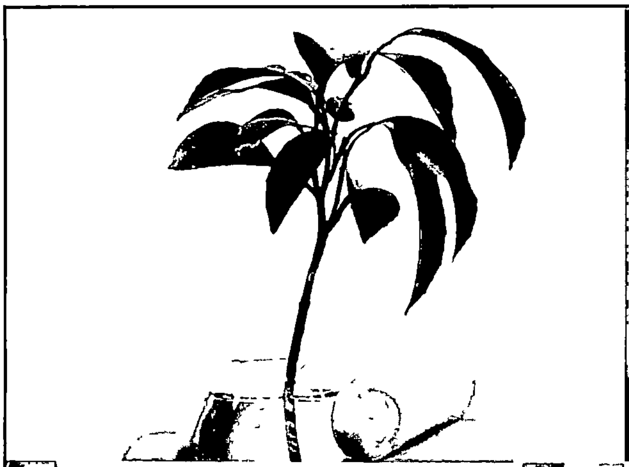

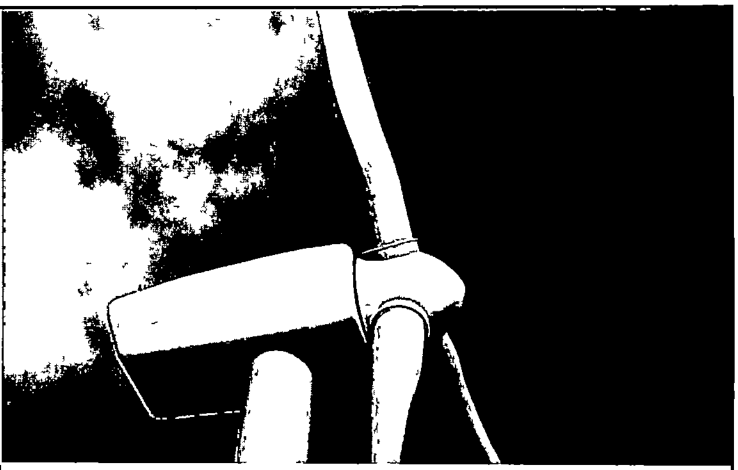

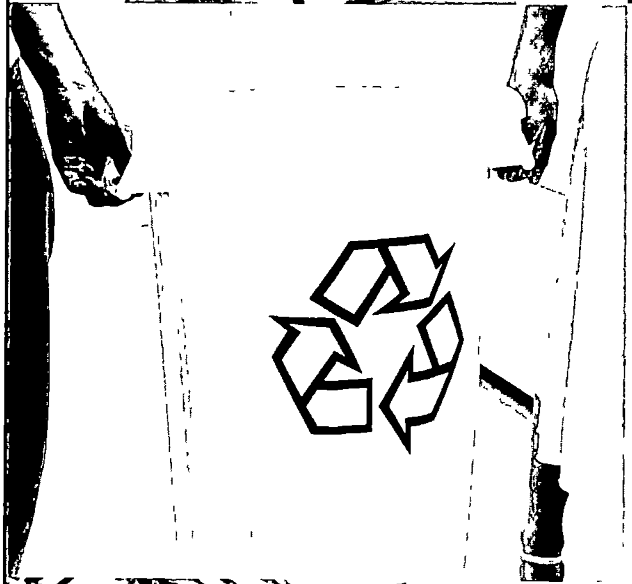

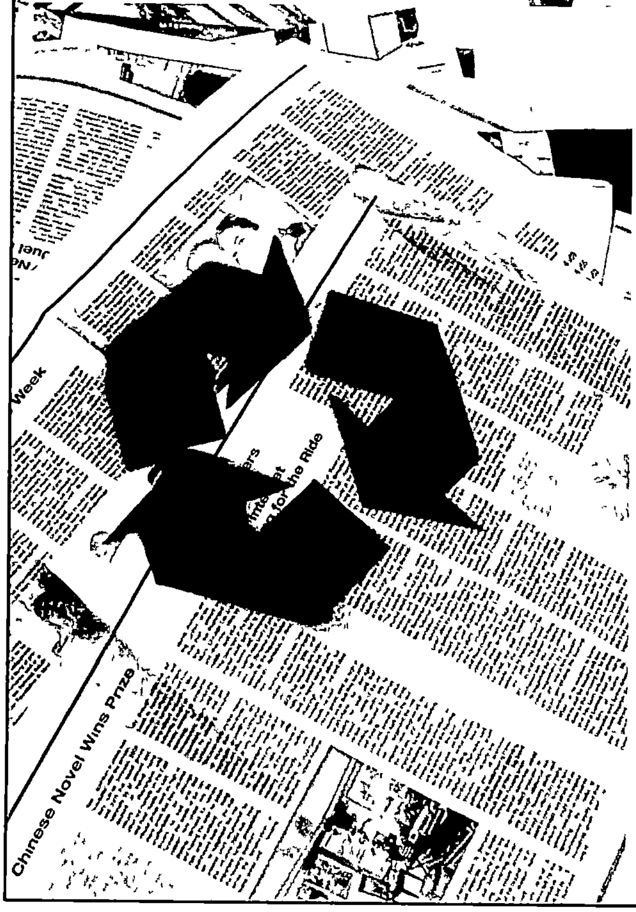

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David J. Reibstein, George Day, & Jerry Wind

Guest Editorial: Is Marketing Academia Losing Its Way?

There is an alarming and growing gap between the interests, standards, and priorities of academic marketers and the needs of marketing executives operating in an ambiguous, uncertain, fast-changing, and complex marketspace. This has gone beyond the familiar dilemma of academic research pitted against practical relevance. Our contention is that this widening divergence has become detrimental to the long-term health of the field. We share our concerns and offer proposals for better aligning the interests of marketing academics and practitioners to their mutual benefit. We are guided by the belief that the role of academic marketing is not just to advance theory and methods but also to have an impact on the practice of marketing.

Diagnosing the Divergence

Our concern centers on the following question: Why do marketing academics have little to say about critical strategic marketing issues and emerging issues, such as the impact of networked organizations, the impact and marketing of emerging technologies, the value of open innovation, the blurring of value chains, unethical marketing practices, the role of brands in global markets, the role of marketing when the customers are empowered, and the constant struggle of marketing practitioners to get a seat at the corporate strategy table? We certainly endorse and acknowledge ongoing work in marketing academia that contributes to practice, with the caveat that the audiences for most of this work have a tactical perspective because they are lower in the organization—often in the marketing research department.

Granted, the larger system of business education is under increased scrutiny for a presumed loss of relevance. Criticisms are being leveled at the dominant MBA focus on narrow analytical and cognitive skills, stylized treatment of complex issues by teachers with no direct business experience, self-centered careerism, and the declining recognition that management is as much a clinical art as a science. It is further charged that the prevailing paradigm of reductionist, narrowly specified, and fragmented research, produced by "solo scholars" or small teams, cannot address the multifunctional and interconnected problems of managers. Although these concerns loom large for management education in general, the dilemma is magnified in marketing—a field that is supposed to be concerned about the connection of the firm with its customers and other stakeholders.

Within this context, the domain of academic marketing has been steadily shrinking, with a concomitant loss of academic influence. Some of this diminution is a consequence of the preemption of marketing frameworks, concepts and methods by other fields of academic enquiry. This has happened primarily because of the overlap with other functional areas and the lack of progress made by marketers in some of these critical areas. The strategy field has successfully imported fundamental marketing concepts such as business and market selection, business and revenue model definition, segmentation, positioning, innovation and diffusion processes, and value propositions, making them more useful to general managers (e.g., Christensen and Raynor 2003; Kim and Mauborgne 2005; Porter 1985). Through a process of benign neglect, academic marketing has left voids that other fields have filled. The best work on product quality and variety, product design, and comprehensive customer solutions is in operations management (e.g., Ulrich and Eppinger 2007). New and insightful perspectives on channels are being provided by network theorists, and the valuation of intangible marketing assets is shifting to finance and accounting (e.g., Ittner and Larcker 1998, 2003). The consumer insights getting the most notice in the public's eye are attributable to behavioral economics and no longer to marketing (e.g., Thaler and Sunstein 2009). Some of the best work on new media and its applications is being done by a cross-functional, predominantly nonmarketing group at Media Labs at the Massachusetts Institute of Technology, initiated by Negroponte (1995) and carried on by Jenkins (2008).

Finally, the growing balkanization of academic marketing into quantitative modeling and consumer behavior has diminished research on strategic marketing issues. Consumer behavior researchers are reluctant to consider the managerial implications of their work. With some notable exceptions, there are few efforts to address the critical challenges facing marketing managers from both the modeling and the behavioral perspectives. Holding all research to rigorous standards is correct. However, we need to ensure that the concepts and methods employed are appropriate for generating valid insights into critical research questions, not whether the methods are the most advanced.

The prevailing research paradigm in most parts of marketing academia is to begin with a new methodology, data set, or a behavioral hypothesis and only then occasionally ask where it might be applied. This reduces the odds of

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addressing a pressing marketing issue. The resultant conclusions are of some relevance to other researchers, but they offer little guidance for marketing decision making. We believe that a better approach is to begin with an important problem and bring to it the best combination of methodology, data, and theory. Research that illuminates important, substantive issues should be applauded, even if no new methodologies or theories are advanced.

Agenda for Action

Our proposals are aimed at stimulating debate within the community of marketing scholars. Our goal is to reverse this trend toward marginalization of the academic discipline and, thereby, to enhance the influence of marketing practitioners in the strategy dialogue. We center our comments on two principle ideas—challenging the inward mind-set and bringing greater relevance to the research agenda.

Challenge the Inward-Looking Mind-Set

What can be done to reverse the creeping bifurcation of academic marketing into two self-contained and self-referential areas—quantitative methods and behavioral studies—without losing the undeniable advantages of deep immersion and specialized mastery of a topic? First, we believe that few business problems can be solved by either area alone and that both behavioral and quantitative approaches are needed. Mechanisms are needed to stimulate and fund large-scale research initiatives that encourage collaboration. Perhaps this would help bridge the silos that academic marketing has created with industry and with other management disciplines. Second, the history of the field endorses the value of engagement with practitioners. Some of the best work has come from collaboration between marketing scholars and managers who are developing "theories-in-use" and experimenting with responses to difficult problems. Academics bring rigor to the process of learning from these experiments, developing new tools, and testing the generality of the findings. We contend that the gulf between marketing academics and senior marketing and corporate officers has widened. Academics are not listening to marketers' needs and the issues they confront. The number of academics attending chief marketing officer and other chief executive officer forums or paying attention to the output is negligible.

Bring Greater Relevance to the Research Agenda

Academic marketing will be more self-confident, relevant, and respected if it can deploy its strengths in theory development, methodology, and rigor of inquiry to pressing strategic issues. This would be mutually beneficial because the solutions to the difficult problems facing corporations and society require a combined approach. Consider the following illustrations of issues that are researchable:

1 *Major societal concerns*. How can marketing contribute to rebuilding confidence in the global financial system, finding a role for consumer choice in health care reform, reducing obesity, encouraging energy conservation, meeting the needs of consumers in developing countries, and so forth?

2 *Achieving profitable growth*. How can marketing improve practice by finding the best pathways for innovation that create new value for customers, contain the risks of innovation, use the resources of partners in an open innovation model, and so forth?

2 *Dynamic resource allocation*. How can researchers bring about insight and accountability to help determine the value of marketing to the firm/organization and play a bigger role in the establishment of the marketing budget and how it should be allocated over markets, regions of the world, marketing instruments, and so forth?

4 *The new marketspace*. What are the implications for marketing and business strategy of the advances and proliferation of new media and channels, the fragmentation of markets, the shift of power to the empowered consumer, and so forth?

These four areas are core domains in which academic marketing should have a direct impact and an influence on other disciplines.

To effectively address these and related challenges facing management, academics must (1) improve their understanding of the changing environment, including the current global financial crisis and recession, the new regulatory climate, and the diminished consumer confidence in a "hot, flat, and crowded" world, (2) understand the interdependencies among the environmental forces, as well as among the four domains of investigation we suggest, and the role of other disciplines in addressing these challenges, and (3) understand the implication of the four domains for the required marketing competencies the firm and its network need to develop.

Toward Implementation

To address these fundamental challenges successfully, the discipline needs three sets of interrelated initiatives. Our proposed initiatives are a reflection of our concerns about the direction the field is taking. We hope to help set an agenda whereby we can have a lasting impact on the practice of marketing, not just through our teaching but also through our research. Although some of the issues we identify are institutional and apply to the field, they should apply to each of us as individuals as well—even more so for the tenured faculty in the field. It is our individual responsibility (1) to work on significant and relevant areas of research that make a difference and to demand that of our colleagues as well and (2) to champion the needed institutional changes that will facilitate it.

Change the Incentives

It is a human nature to respond to what is rewarded. Currently, most promotion and tenure decisions depend on articles published in leading journals and, to a lesser degree, on teaching and service. It is time that promotion and tenure decisions also take the contributions to the advancement of marketing practice into consideration. If it is accepted that part of the purpose of business schools is to advance the practice of business and, in our case, the practice of marketing, including its impact on business strategy, business success, and society's ability to address its challenges, this should be part of the consideration for tenure, salary increases, and recognition

Bring Rigor and Relevance to Doctoral Programs

Most of the doctoral marketing programs today provide rigorous training in research methodology and theory In general, candidates must declare which track they are in, behavioral or quantitative, not the substantive issues they are addressing, and then dive deeper into their respective disciplines This provides a good foundation for conducting research, and we do not quibble with any of it What is of concern is what is missing—namely, marketers' problems and the understanding of and passion for business Little, if any, time is spent on understanding the context of business and the day-to-day and strategic issues confronting managers We believe that because marketing is an applied business discipline, it is necessary to spend time in doctoral programs on these issues Having more doctoral students coming directly from undergraduate programs has made it possible to grab some of the brightest students before they are consumed by business and MBA programs and, thus, their starting salaries That being said, the lack of business experience and/or MBA training has come at a cost—the lack of exposure to management issues

Mobilize the Institutions

Journals play a pivotal role Rather than taking leadership and calling for research that addresses pressing practitioner issues, journals are mostly content to react to what is sent to them As a result, it is a fair question to ask who is reading the published articles Are we mostly talking to ourselves?

The leading journals should actively solicit articles that creatively and insightfully address the concerns of senior marketers, even if they do not introduce a new methodology or advance basic theory Currently, there seems to be little taste among the top-tier journals for thoughtful, rigorous conceptual articles that suggest new research directions We strongly endorse the encouragement from the editor of *Journal of Marketing* for more conceptual articles

The field of marketing has two long-established and credible bridging mechanisms in the Marketing Science Institute and the Institute for the Study of Business These are forums in which leading academics and practitioners can meet to address common problems Increasingly, these problems have come to be dominated by the concerns of the marketing research practitioners We strongly encourage both organizations to stay true to their roots and to seek guidance from senior marketers and other senior executives who face significant strategic issues It would even be desirable to solicit input from chief executive officers and chief financial officers as to what they need from marketing that is not being adequately addressed We believe that this will yield research priorities that will help advance the discipline and its impact

Conclusion

Our call is for the whole marketing academic community to work on relevant business problems This is an easier path to undertake after tenure has been achieved than before, at least until the structural changes are in place Working on relevant issues and making a difference in the practice of marketing can be both engaging and enjoyable It feels good when your work makes a difference Frank Bass's (1969) greatest pride centered on the creation of the Bass model—not simply because of the stream of research that followed but also because of its widespread application in business

It would be easy to read this editorial and pass it off as "not my responsibility," as we wait for the institutional changes to take place However, it is our responsibility to work on relevant problems, make a difference, and push for institutional changes If we don't, who will? Let us heed the warning of the ancient Chinese wisdom, which says, "Unless we change our direction, we are likely to end up where we are headed"

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Stefan Stremersch & Walter Van Dyck

Marketing of the Life Sciences: A New Framework and Research Agenda for a Nascent Field

Although marketing scholars often seek to contribute new knowledge that is applicable across industries, some industries have unique characteristics that require industry-specific knowledge development. The authors argue that this requirement applies to the life sciences industry, defined as companies in pharmaceuticals, biotechnology, and therapeutic medical devices. Marketers in the life sciences industry face novel and unique challenges along eight decision areas in therapy creation, therapy launch, and therapy promotion. In therapy creation, they face therapy pipeline optimization, innovation alliance formation, and therapy positioning decisions. In therapy launch, they face global market entry timing and key opinion leader selection decisions. Therapy promotion mostly revolves around sales force management, communication management, and stimulating patient compliance. The authors qualify these decision areas according to their practical importance and academic potential. The article derives preliminary generalizations and propositions from prior research and practice and steers further research in specific directions. The authors believe that marketing of the life sciences offers a fertile area for further research because, among other things, its potential impact transcends any problems typically investigated by marketing scholars.

Keywords: life sciences, marketing theory, research agenda, pharmaceutical, biotechnology, medical device, marketing, sales

Although marketing scholars often seek to contribute new knowledge that is applicable across industries (Stewart 2002), some industries have unique characteristics that require industry-specific knowledge development (Eliashberg, Elberse, and Leenders 2006). Examples include the services industry (Parasuraman, Zeithaml, and Berry 1985; Rust and Chung 2006; Vargo and Lusch 2004), the entertainment industry (Eliashberg, Elberse, and Leenders 2006; Eliashberg and Shugan 1997), and the high-tech industry (Bourgeois and Eisenhardt 1988; Glazer and Weiss 1993; Heide and Weiss 1995; John, Weiss, and Dutta 1999; Stremersch et al. 2007; Weiss and Heide 1993).

In this article, we argue that this requirement also applies to the life sciences industry. In our definition, this industry spans companies in pharmaceuticals, biotechnology, and therapeutic medical devices, and it forms the innovative producer side of the health care industry. Two fundamental dimensions underlie the life sciences industry: science-based knowledge (know-why) and quality of life.

Life sciences companies are significantly more linked to science than any other industry and convert the know-why they develop into new therapies (therapy creation). The resultant therapy is launched into society only after scientific review of its impact on people's quality of life through examination of the therapy's safety, efficacy, and incremental cost effectiveness (therapy launch). Life sciences firms promote their life sciences therapies to both health care providers and patients within the regulatory framework designed by society (therapy promotion). Marketers face unique challenges in therapy creation, therapy launch, and therapy promotion decisions (see Figure 1).

The scant survival probability of newly created therapeutic inventions—only 1 in 5000–10,000 new inventions eventually makes it to market—leads to life sciences development portfolios being uniquely shaped as funnels (Ding and Eliashberg 2002). Life sciences marketers decide on therapy positioning—the match between indication and new therapy—many years before market entry. Market entry for new therapies is strictly regulated, differentially so across countries. If market access is granted, manufacturers get a limited time—in most cases, 20 years as of initial application filing, 10–12 of which are typically spent in clinical development—of market exclusivity, after which generic therapies can enter the market. Life sciences firms' marketing efforts are typically capped (e.g., in many European countries) and/or regulated (e.g., some states in the United States require medical sales representatives to undergo a

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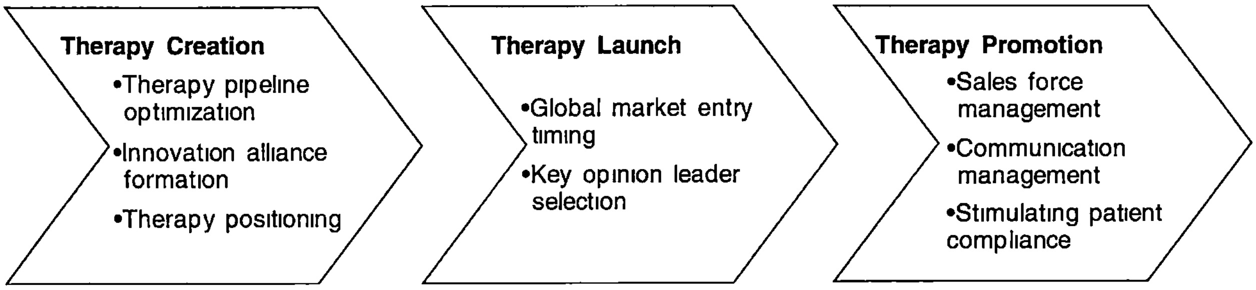
FIGURE 1
Key Marketing Decision Areas in Life Sciences Firms


Therapy Creation
•Therapy pipeline optimization
•Innovation alliance formation
•Therapy positioning
Therapy Launch
•Global market entry timing
•Key opinion leader selection
Therapy Promotion
•Sales force management
•Communication management
•Stimulating patient compliance

certification process) Life sciences is also one of the few industries in which manufacturers are legally prohibited from communicating directly with their end customer (with the exception of New Zealand and the United States)

The life sciences industry constitutes an important and growing part of the economy, for example, the U S life sciences industry represented $271 billion of global sales in 2007 (Pharmaceutical Research and Manufacturers of America 2008) In the United States, prescription drug spending—the life sciences industry's largest component—is expected to accelerate through 2017 (Centers for Medicare & Medicaid Services, Office of the Actuary 2008)

Because of its vast importance and unique challenges, the marketing literature has recently turned to the life sciences industry to study sales force effectiveness (Manchanda and Chintagunta 2004, Manchanda and Honka 2005, Manchanda, Rossi, and Chintagunta 2004, Mizik and Jacobson 2004, Venkataraman and Stremersch 2007), therapy compliance (Bowman, Heilman, and Seetharaman 2004, Wosinska 2005), communication effectiveness (Cleanthous 2004, Iizuka and Jin 2005, Macias and Lewis 2003, Mukherji, Dutta, and Rajiv 2004, Wosinska 2006), and innovation (Chandy et al 2006, Ding and Eliashberg 2002, Prabhu, Chandy, and Ellis 2005, Sorescu, Chandy, and Prabhu 2003, 2007, Wuyts, Dutta, and Stremersch 2004), among other areas

The objectives of the current research are to evaluate prior research, suggest new directions for further research, and ignite life sciences marketing as an important area for scholarly research We achieve these objectives by defining the life sciences industry and discerning its boundaries, deriving the key marketing decision areas in this industry, formulating generalizations and propositions derived from prior research and state-of-the-art practice, and steering further research in specific directions

Defining the Life Sciences Industry and Its Boundaries

Underlying Dimensions of the Life Sciences Industry

A first constitutive characteristic of the life sciences industry is that this industry creates scientific knowledge regarding why a certain therapy affects the human body in a certain way Science represents "know-why" (Kogut and Zander 1992), in contrast to technology, which represents "know-how" (Quinn, Baruch, and Zien 1997) The average number of scientific studies a firm cites when applying for a patent for its inventions (science linkage), rather than other prior patents (know-how development), can be used as a measure of the extent to which the firm is science based (Narin 2001)

A second constitutive characteristic of the life sciences industry is that the preventive or curative therapies it creates are scientifically reviewed regarding their effect on people's quality of life, after which they are promoted to patients and providers to convince them of the acclaimed effects Improvement in quality of life is expressed as an increase in "quality-adjusted life years" (often referred to as QALYs) and can lie in enhanced effectiveness, reduced side effects, and improved convenience (Garber and Phelps 1997) It is based on both quantity and quality of life years generated by the medical interventions

The Components of the Life Sciences Industry

We discern three components within the life sciences industry pharmaceutical, biotechnological, and therapeutic medical devices These three industries are science based because their patents typically refer to more scientific studies than any other industry For example, Narin (2001) shows that pharmaceutical and biotechnology firms, respectively, cited 7 3 and 14 4 scientific references per patent, which were the two highest science linkages of all technology areas Though not separately identified in Narin's study, therapeutic medical devices are also science based First, the average science linkage of all medical devices and equipment companies, which includes therapeutic medical devices, is more than twice the average of the high-tech industry, such as aerospace or information and communication technologies (Narin 2001) Second, therapeutic medical devices companies, such as Nektar Therapeutics or ArthroCare, belong to the most science-based companies in the economy[1]

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[1] Nektar Therapeutics offers noninvasive deep-long delivery systems ArthroCare offers minimally invasive surgical procedures involving tissue removal and treatment

These three industries also market products that aim to improve the quality of life. They market inorganic compounds (pharmaceutical), organic compounds (biotechnology), or therapeutic devices that affect the (diseased) human body. Take breast cancer as an example. Pharmaceutical firms aim to improve breast cancer patients' condition through chemotherapy, and biotechnology firms may offer targeted therapies in well-identified patient types (e.g., Herceptin by Genentech). Device-based therapies are also often used with the same objective of increasing quality-adjusted life years (e.g., through radiotherapy).

Discerning the Boundaries of the Life Sciences Industry

Our definition of the life sciences industry enables us to discern life sciences boundary industries (see Figure 2)—namely, cosmeceuticals, medical devices and equipment, and nutraceuticals. Each of these industries contains a small segment that belongs to the life sciences industry because it produces therapies that are science based and improve quality of life.

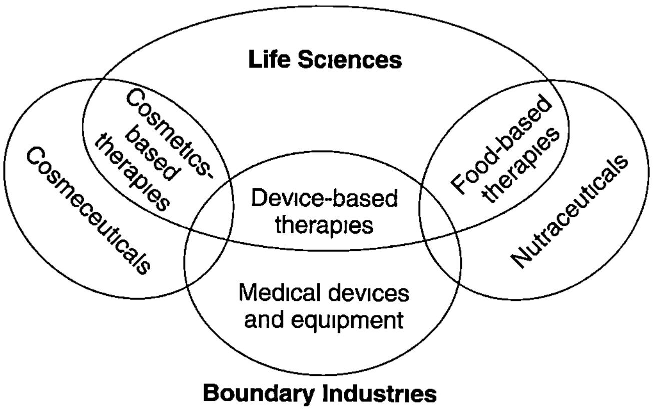
Typical cosmeceuticals are antiwrinkle agents or balms to treat eczema or burning wounds. They prevent, treat, or cure diseases, mostly of the skin. Therefore, they are distinct from mere cosmetics, which aim to alter appearance of the skin, eyes, hair, nails, and so forth. Some cosmeceuticals (i.e., cosmetics-based therapies) are science based (e.g., acne care products with therapeutic antiseptics).

Medical devices and equipment vary from wheelchairs to imaging devices (e.g., magnetic resonance imaging) to stents. Equipment such as wheelchairs improve the patient's quality of life (e.g., through mobility), but they are not science based. In contrast, medical imaging devices do not therapeutically improve humans' quality of life but represent considerable know-why (science). Some devices (i.e., device-based therapies), such as stents, implants, and pacemakers, enhance the quality of life and are science based; thus, they belong to the life sciences industry.

Nutraceuticals refer to products such as nutritional supplements, vitamin- or calcium-enriched foods, and polyunsaturated fatty acids. Nutraceuticals may improve quality of life beyond merely feeding the body (foods). However, only a subset of these products (i.e., food-based therapies) is science based and, thus, part of the life sciences industry. An example is sterol-derived, cholesterol-lowering BENECOL.

Therapies exist that include both a device and a cosmeceutical or nutraceutical component. Examples include breast implants (cosmeceuticals and devices) and nutrigenomics, that is, personalized diet recommendations based on diagnostics of bodily fluids (nutraceuticals and devices). Figure 3 positions the life sciences industry in the health care market (adapted from Burns 2005). Payment flows from left to right, from payers to providers, over financial intermediaries. Products flow from right to left, from producers to providers, over product intermediaries. The life sciences industry is the producer side of the health care market.

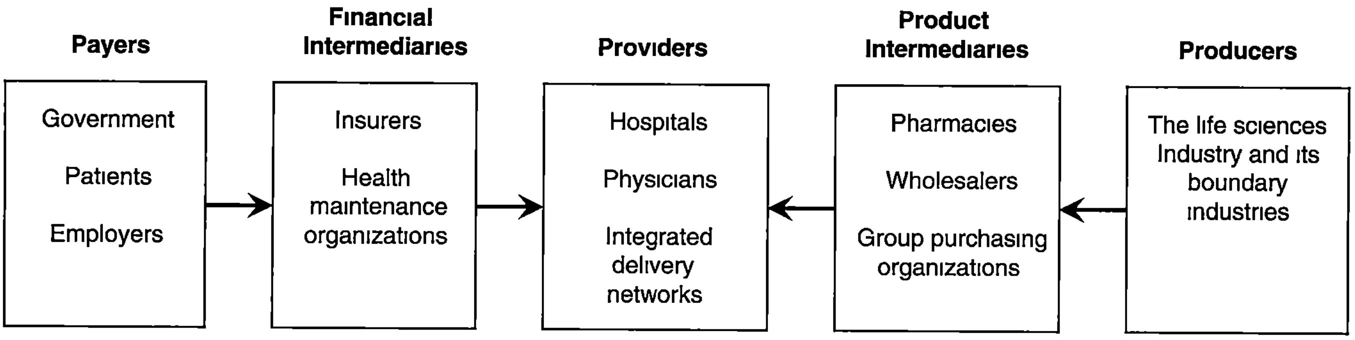
FIGURE 2
The Life Sciences Industry and Its Boundaries



Key Marketing Decision Areas in the Life Sciences Industry

Next, we derive the key decision areas for marketers in the life sciences industry. We first discuss our methodology, after which we identify and qualify the key marketing decision areas on managerial relevance and scholarly potential.

FIGURE 3
The Life Sciences Industry in the Health Care Market



Source: Adapted from Burns (2005).

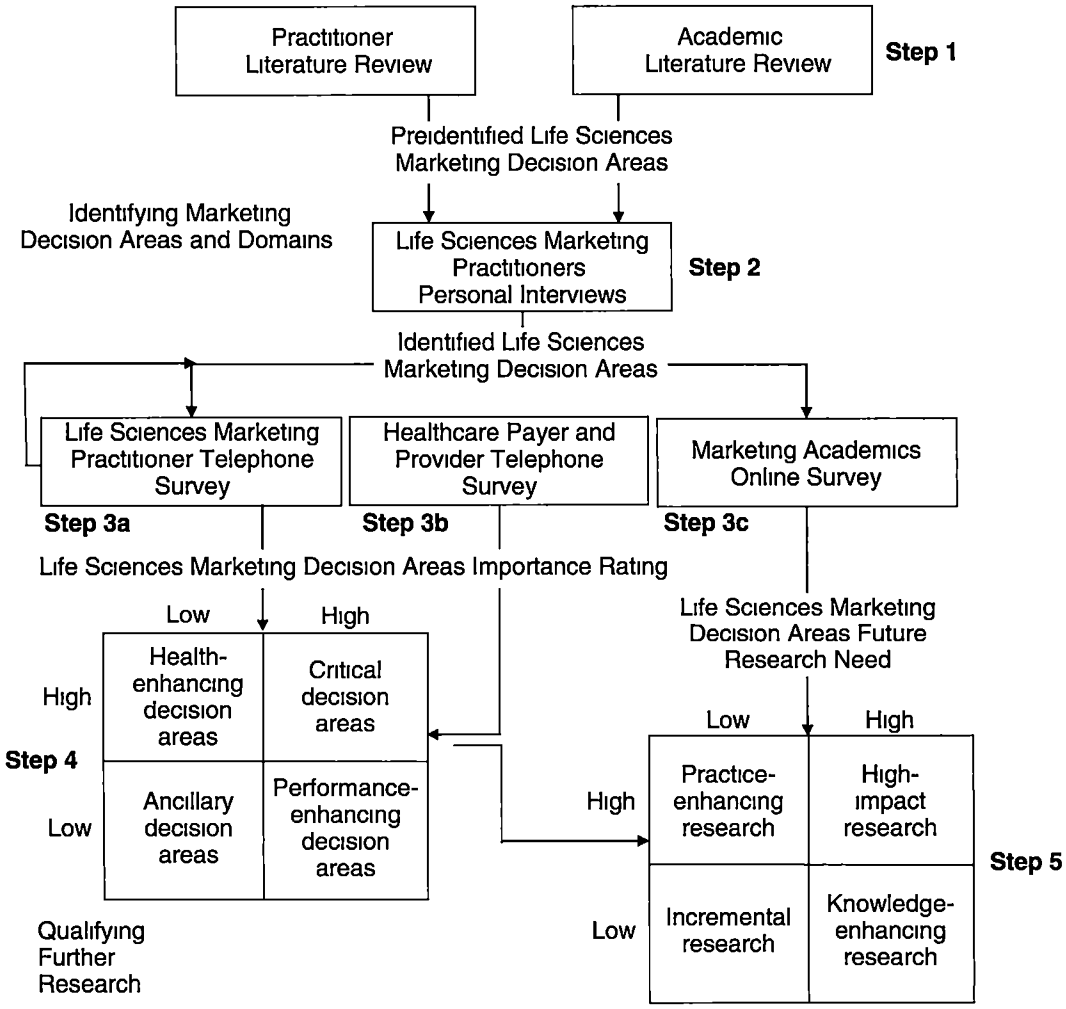
Methodology

Figure 4 graphically depicts our methodology We first identified marketing decision areas in life sciences from a literature study (Step 1)[2] Appendix A provides an overview of the major publications in life sciences marketing according to the three areas we defined—therapy creation, launch, and promotion These publications include *International Journal of Research in Marketing*, *Journal of Consumer Research*, *Journal of Marketing*, *Journal of Marketing Research*, and *Marketing Science*, which have been used in prior research as a good representation of the major journals in marketing (Stremersch and Verhoef 2005, Stremersch, Verniers, and Verhoef 2007)

Given its relatedness in the health care value chain, Appendix B provides an overview of the health psychology literature in the same major marketing journals It discerns three frameworks in this literature health-related behavior, health risk perception, and health communication Two early schools of thought underlie these frameworks protection motivation theory and the health belief model Protection motivation theory predicts protection intentions as a function of severity, vulnerability, response efficacy, and self-efficacy and is used to test the effectiveness of health communication (Maddux and Rogers 1983, Rogers 1975, see also Keller and Lehmann 2008) The health belief model (Becker 1974, Rosenstock 1974) proposes that increasing risk perceptions should lead to precautionary behavior (see Menon, Raghubir, and Agrawal 2008)

Though more distant to the life sciences marketing field, we also reviewed the health economics literature The literature provides good reviews on the cost of innovation

FIGURE 4
Methodology


Practitioner Literature Review
Academic Literature Review
Step 1
Preidentified Life Sciences Marketing Decision Areas
Identifying Marketing Decision Areas and Domains
Life Sciences Marketing Practitioners Personal Interviews
Step 2
Identified Life Sciences Marketing Decision Areas
Life Sciences Marketing Practitioner Telephone Survey
Healthcare Payer and Provider Telephone Survey
Marketing Academics Online Survey
Step 3a
Step 3b
Step 3c
Life Sciences Marketing Decision Areas Importance Rating
Low
High
High
Low
Health-enhancing decision areas
Critical decision areas
Ancillary decision areas
Performance-enhancing decision areas
Step 4
Qualifying Further Research
Life Sciences Marketing Decision Areas Future Research Need
Low
High
High
Low
Practice-enhancing research
High-impact research
Incremental research
Knowledge-enhancing research
Step 5

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[2] Our sample of academic literature included (1) marketing journals, such as *Journal of Marketing*, (2) journals on the boundaries of the marketing discipline, such as *Management Science*, (3) specialized journals in life sciences and health economics, such as *Journal of Health Economics*, (4) recent proceedings of conferences, such as the INFORMS Marketing Science Conference (2000–2008) and the Association for Consumer Research conference (2000–2008), and (5) unpublished working papers In the study of the industry literature, we included *Journal of Medical Marketing*, *Life Sciences*, *Medical Device Technology*, *Medical Marketing & Media*, *Pharmaceutical Executive*, and *Pharma Marketing News*, among others

(see DiMasi, Hansen, and Grabowski 2003), price competition among pharmaceutical firms (see Bhattacharya and Vogt 2003, Scherer 1993), the effect of generic entry on branded drug prices (see Frank and Salkever 1997, Grabowski and Vernon 1992), health care policy (see Drummond, Jonsson, and Rutten 1997, Scherer 2004), and reference pricing (see López-Casasnovas and Puig-Junoy 2000)

In Step 2, we conducted two-hour personal interviews with nine marketing experts in life sciences companies, such as Amgen, GlaxoSmithKline, Novartis, Novo Nordisk, and Philips Medical Systems To have sufficient confidence in our findings and to qualify the marketing decision areas we identified in terms of importance, we conducted quantitative telephone surveys with marketing managers at life sciences firms and with health care payers and providers, and we conducted an online survey of marketing academics

We sampled marketing managers (Step 3a) using a snowballing technique, first contacting respondents we knew personally, then contacting executives the first respondents identified as useful respondents, and so on In total, we contacted 110 executives, 96 of whom agreed to participate in the telephone interview (for a response rate of 87%) 40 managers of pharmaceutical firms (e g , Astellas Pharma, AstraZeneca, Bristol-Myers Squibb, GlaxoSmithKline, Johnson & Johnson, MSD, Novartis, Novo Nordisk, Organon, Pfizer, Roche, Sanofi-Aventis, Schering-Plough, Wyeth), 28 managers of biotech firms (e g , Amgen, Biogen Idec, Galapagos, Genzyme, Novo Nordisk, Organon), and 28 managers of medical devices companies (e g , 3M Medical Specialties, AGFA HealthCare, B Braun, Coloplast, Johnson & Johnson, Philips Medical Systems, Siemens Medical Solutions) We overweighted the pharmaceutical industry, given its larger size compared with the others From these managers, we inventoried key decision areas (open question) and the importance of each previously identified (Steps 1 and 2) decision area for the firm on a 1–7 scale

We sampled health care payers and providers (Step 3b) from contact lists provided by IMS Health From a sample of 545 payers and providers, 112 respondents participated (for a response rate of 21%), 81 of whom were physicians (health care providers) and 31 of whom were representatives of health care government and health management organizations (health care payers) From this sample, we assessed the impact of the previously identified (Steps 1–3a) marketing decision areas on patient welfare on a 1–7 scale

We sampled academics (Step 3c) using two criteria (1) They had a position in marketing, and (2) they had knowledge relevant to the life sciences industry through their academic research From a sample of 78, the following 29 academics eventually participated (for a response rate of 37%) N Agrawal, M Ahearne, R Bezawada, L Bolton, D Bowman, R Chandy, A Ching, M Dekimpe, M Ding, X Dong, J Eliashberg, P A Keller, L Krishnamurthi, M F Luce, P Manchanda, M K Mantrala, N Mizik, C Moorman, H Nair, J C Prabhu, V Shankar, C Sismeiro, A Sorescu, E R Spangenberg, P Stern, D Vakratsas, C Van den Bulte, S Venkataraman, and S Wuyts For each of the previously identified marketing decision areas (Steps 1–3a), we asked the academics to assess (on a 1–7 scale) the extent to which (1) they are covered by current marketing research in progress, (2) they deserve more scholarly attention in the future, and (3) they are perceived by academics as important for life sciences marketers in practice

Step 4 yields the practical impact of life sciences marketing decision areas from both a firm profit perspective and a patient welfare perspective Step 5 consists of mapping the need for academic research, as perceived by academics, onto decision area importance, as perceived by practitioners (combining the input of both marketing managers and health care providers and payers)

Identification of Key Marketing Decision Areas

Figure 1 contains the marketing decision areas we retained as key areas, grouped into three higher-level decision domains therapy creation, therapy launch, and therapy promotion In therapy creation, the key decision areas are therapy pipeline optimization, innovation alliance formation, and therapy positioning The key decision areas in therapy launch are global market entry timing and key opinion leader selection The key decision areas in therapy promotion are sales force management, communication management, and stimulating patient compliance Table 1 describes each decision area The second column presents the clarification we provided to respondents when we asked them to rate the decision area's importance The third column contains the associations respondents made for each decision area during our interviews

Qualifying Key Marketing Decision Areas in Terms of Research Potential

In Step 4 (for more details, see Figure 5), we join relevance in terms of business performance (averaged over all life sciences firms we surveyed) and relevance in terms of patient welfare (average of the averages over all surveyed payers on the one hand and all surveyed providers on the other hand[3]) Average importance to business performance ranged from 4 8 (innovation alliance formation) to 5 6 (sales force management), while average importance ratings to patient welfare ranged from 3 6 (therapy positioning) to 5 2 (communication management), all on a scale ranging from 1 to 7 In Figure 4, we qualify the different cells as follows (1) "Critical decision areas" are of above-median importance to both business performance and patient welfare, (2) performance-enhancing decision areas are of above-median importance to business performance and of below-median importance to patient welfare, (3) health-enhancing decision areas are of below-median importance to business performance and of above-median importance to patient welfare, and (4) ancillary decision areas are of below-median importance to both business performance and patient welfare

Communication management and key opinion leader selection appear to be critical decision areas Global market

---

[3] The responses of payers were similar to the responses of providers The correlation between the average ratings across both groups of respondents was 90, yielding a similar ranking on importance of decision areas

TABLE 1
Description of Key Decision Areas in Our Survey

Decision Area	Clarification Provided to Respondents	Associations That Respondents Made
Therapy Creation		
Therapy pipeline optimizations	Includes premarket decisions on portfolio or pipeline optimization	"Our pipelines of the future will have to contain more targeted therapy-diagnostic combination projects" (Johnson & Johnson)
Innovation alliance formation	Includes decisions regarding alliances during product development	"How do we get synergy amongst alliance partners?" (Philips Medical Systems)
Therapy positioning	Includes premarket decisions on competitive positioning (including segmentation, targeting) of the product	"Instead of being product-minded, we should become more solution-minded" (Philips Medical Systems)
Therapy Launch		
Global market entry timing	Includes decisions regarding optimal market entry timing, pioneer versus follower advantages, international launch strategy, and new product market potential forecasting	"At present, marketing and pricing is too country specific How do we make a good trade-off between local and global market entry?" (Johnson & Johnson)
Key opinion leader selection	Includes the structuring of the company's key opinion leader network for maximum effectiveness	"We assured fast product uptake in a socially retarded area by convincing the members of a local fertility control council exerting high impact on the local doctors" (Organon)
Therapy Promotion		
Sales force management	Includes decisions on optimal sizing and targeting of the sales force, decisions that optimize sales call quality, and the optimal use of product samples, including sales response models	"It is absolutely necessary for sales people to have the level necessary to build relationships with healthcare providers" (B Braun)
Communication management	Includes the design of optimal communication strategies, including the use of medical publications, DTCA, and Internet-based communications that reach patient and physician disease communities	"How to reach patients with the present regulatory restrictions?" (Roche)
Stimulating patient compliance	Includes the design of optimal patient compliance programs	"There's a gamut of new technologies, like smart pill bottles, coming available now to support compliance We should consider them in our product delivery designs" (Johnson & Johnson)

entry timing and sales force management are performance-enhancing decision areas The low relevance of sales force management to patient welfare may explain why many hospitals and physicians have begun to deny access to pharmaceutical sales representatives Therapy pipeline optimization and stimulating patient compliance are health-enhancing decision areas Innovation alliance formation and therapy positioning decisions are ancillary, probably to therapy pipeline optimization

In Step 5 (for more details, see Figure 6), we confront the practical importance of decision areas (taken to be the highest of importance in terms of business performance and patient welfare) with the need for academic research, as perceived by academics The average need for further academic research ranges from 5 0 (sales force management) to 5 8 (stimulating patient compliance) on a scale ranging

FIGURE 5
Importance of Decision Areas to Firm Performance and Patient Welfare

		Importance to Life Sciences Business Performance	
		Below Median	**Above Median**
Importance to Patient Welfare	**Above Median**	•Therapy pipeline optimization •Stimulating patient compliance	•Communication management •Key opinion leader selection
	Below Median	•Innovation alliance formation •Therapy positioning	•Global market entry timing •Sales force management

FIGURE 6
Research Agenda

		Future Research Need	
		Below Median	Above Median
Importance to Life Sciences Business Performance and Patient Welfare	Above Median	•Communication management •Sales force management	•Therapy pipeline optimization •Global market entry timing •Key opinion leader selection •Stimulating patient compliance
	Below Median	•Therapy positioning	•Innovation alliance formation

from 1 to 7 In Figure 4, we qualify the cells as follows (1) High-impact research is research that promises to be an important contribution to academic knowledge and of high, immediate, practical relevance to business performance and/or patient welfare, (2) knowledge-enhancing research is research that promises to be an important contribution to academic knowledge but is not necessarily of immediate, practical relevance, (3) practice-enhancing research is research of high, immediate, practical relevance to business performance and/or patient welfare but is not necessarily of immediate academic importance, and (4) incremental research is research that is neither of high, immediate, practical relevance nor necessarily an important contribution to academic knowledge

Although all four types of research are valuable in their own right, the chance of gaining a breakthrough insight is the highest in the "high-impact" (top-right) quadrant of Step 5 in Figure 4 (for more details, see Figure 6) Such decision areas are therapy pipeline optimization, global market entry timing, key opinion leader selection, and stimulating patient compliance Further research on innovation alliance formation is qualified as knowledge-enhancing research The academic knowledge generated can be ancillary to decision areas such as therapy pipeline optimization Communication and sales force management are practice-enhancing areas Research on therapy positioning is likely to be incremental

Academics assessed the need for further research on therapy positioning as low because they considered this decision area of low practical relevance, while they assessed the need for further research on sales force and communication management as low because it is already largely addressed in prior and ongoing research, even though its relevance remains high

Generalizations, Propositions, and Directions for Further Research

Drawing on prior research and practice, we formulate preliminary generalizations (G) to evaluate early streams of research in this area, and we develop propositions (P) that provide direction for further research Preliminary generalizations are already supported by the existing literature, but they may benefit from additional testing through techniques such as meta-analyses Propositions are exploratory and at least partly supported by verbal logic, mathematical proof, or empirical evidence (Stremersch and Tellis 2002)

Therapy Creation

Therapy pipeline optimization In life sciences firms, therapy pipelines contain all innovation projects along the following temporal stages During discovery, therapy candidates are screened for maximum activity on the biological target Preclinical development and clinical development entail further development, using in vitro or animal experiments and human experiments, respectively

Prior research on therapy pipelines aimed to determine the optimal number and sequencing of innovation projects that a firm's resource base could support and that served its goal to maximize the number of commercially launched innovations (see Blau et al 2004, Chandy et al 2006, Ding and Eliashberg 2002, Loch and Kavadias 2002) This research found that there is an inverted U-shaped relationship between the number of innovation projects undertaken and the number of innovations commercially launched However, scholars in this literature stream did not discern the different temporal stages in the therapy pipeline Although companies' ability to convert innovation projects in commercially launched products may suffer from taking on too many projects in development, this may not be the case in discovery, in which more exploration leads to more effective knowledge on biological targets, resulting in more new therapy opportunities Thus

> P_{1a} There is a positive relationship between the number of innovation discovery projects initiated and the number of patented inventions of a firm
>
> P_{1b} There is an inverted U-shaped relationship between the number of innovation development projects initiated and the number of commercially launched innovations of a firm

The optimal number of innovation development projects a firm should undertake may also be contingent on the type of innovation project Targeted (specific for certain patient types) therapy innovation projects require fewer resources in development and feature higher probabilities of ultimate regulatory approval (Vernon and Hughen 2005) Thus

> P_2 Innovation development projects on targeted therapies lead to more commercially launched innovations than the same number of innovation development projects on nontargeted therapies

Scholars might also study other types of innovation projects as contingency factors beyond targeted or nontargeted projects, such as radical versus incremental projects Studying the therapy pipeline in the context of patent expiry might also be fruitful Firms may anticipate expiry in multiple ways, such as the development of combination drugs, more convenient administration and dosage methods, and reengineered variants with higher effectiveness or less serious side effects To develop and test such a contingency framework, scholars could analyze databases, such as the

Pharmaprojects database, the R&D Focus Database that IMS Health maintains, and the Food and Drug Administration's (FDA's) Orange Book, all of which contain detailed pipeline information As outcome variables, scholars could gather information on the number of approved new patents (U S Patent and Trademark Office) and new therapies (the FDA's Orange Book) Beyond direct innovation measures, they could also examine the impact of therapy pipeline decisions on sales, profits, or stock market returns

Innovation alliance formation As we noted previously, practitioners consider decisions on innovation alliances ancillary decisions At the same time, this decision area has provided an ideal and often-used testing ground for theory development on interfirm cooperation The reason is that the life sciences industry provides possibly the richest documentation on such alliances (e g , Recap's database on interfirm agreements) and their outcomes (e g , patents, new products, profits, sales, share price)

Similarity between parties in an alliance is probably most often studied Dissimilarity between partners yields greater learning opportunity because there is less knowledge redundancy, while similarity between partners makes it easier to understand each other and share information The tension between both arguments has led many researchers (Cloodt, Hagedoorn, and Van Kranenburg 2006, Prabhu, Chandy, and Ellis 2005, Wuyts et al 2005) to find a curvilinear relationship between knowledge similarity between alliance partners and the innovative outcome that the alliance yields This leads us to the following preliminary generalization

G_1 There is an inverted U-shaped relationship between knowledge similarity between alliance partners and the number of new therapies the alliance yields

Scholars have also studied the differential effect of alliances on radical versus incremental innovation (Wuyts, Dutta, and Stremersch 2004) For radical innovation, it is instrumental that alliance partners repeatedly cooperate to stimulate knowledge transfer through the development of relationship-specific heuristics and the sharing of mental models, among other things (Madhaven and Grover 1998, Uzzi 1997) Genentech and Roche provide a successful example of such repeated collaboration For incremental innovation, large portfolios may be beneficial because of scale effects in development (Ahuja 2000, Wuyts, Dutta, and Stremersch 2004) We offer the following preliminary generalizations

G_2 As the level of repeated partnering in a firm's innovation alliances portfolio increases, its radical innovation output increases

G_3 As the number of alliance partners in a firm's innovation alliances portfolio increases, its incremental innovation output increases

Further research on interfirm cooperation will likely continue to use the life sciences industry as a testing ground for theory development, with continued use of databases (e g , Pharmaprojects, Recap), newspapers and magazines, and surveys Novel breakthroughs are likely to be in the areas of social networks and the balance between internal and external innovation

Therapy positioning Therapy positioning refers to research-and-development (R&D) decisions on the envisioned therapy toward specific indications The practitioners we surveyed considered therapy positioning an ancillary decision area, while academics did not foresee a strong need for further research Therefore, we do not derive theoretical generalizations or propositions Decision makers need to balance three key dimensions (1) the likelihood that the therapy will be approved for the respective indication, (2) the price they will obtain from the therapy, and (3) the market size for the respective indication over time

If positioned for a mild indication, a therapy may reach a large market, but at relatively low prices and with possible denial of approval Consider Elidel (pimecrolimus), a therapy for eczema by Novartis Novartis introduced Elidel for a mild to moderate indication of eczema—that is, for first-line use Competitor Fujisawa introduced a variant of this molecule, Prograf (tacrolimus), which was targeted at moderate to severe indications of eczema—that is, for second-line use Although both products showed scientific evidence, only tacrolimus was endorsed by the U K government, because the former could not show that it represented a good value for the money (Gregson et al 2005) for the moderate indication It was subsequently endorsed after resubmission, but then also for the severe indication If positioned for a severe indication, a therapy may have a higher likelihood of being approved at a high price, but it may pertain to a relatively small market For example, Symbicort by AstraZeneca was first approved for severe asthma, after which AstraZeneca enlarged the market for Symbicort to chronic obstructive pulmonary disease (COPD)

Because there are many possible indications, all with different levels of uncertainty for the respective therapy to be approved and varying price expectations, further research should aim to specify decision support models that simulate market size using patient flow dynamics (first use, reuse, switching from competition) at various price expectations and approval likelihoods

Therapy Launch

Global market entry timing Previous research has shown that pioneers do not have long-lasting market advantages (Golder and Tellis 1993, Shankar, Carpenter, and Krishnamurthi 1999) In the life sciences industry, an important moderator of the market return on a pioneering therapy may be whether it pertains to generic or branded therapies In the case of branded therapies, pioneers are the first entrants in a therapeutic category (e g , Mevacor [1987] for statins) In the case of generic therapies, pioneers are the first generic available for a specific therapy (e g , the first generic Simvastatin, the statin introduced by Merck as Zocor)

There are many cases of late branded entrants that took over pioneers through increased effectiveness, higher convenience, or weaker side effects Examples include Zocor and Lipitor in statins (increased effectiveness), Symbicort in asthma/COPD (higher convenience), and Xyzal in antihistamines (weaker side effects)

Contrary to common wisdom in other industries and contrary to branded variants in life sciences, generics may yield strong pioneering advantages The first generic variant for a specific therapy ("the pioneer") may attract and maintain a disproportionately large market share The reasons for this are multifold It takes substantial effort from physicians and pharmacists to explain bioequivalence between different variants (Gupta, Yu, and Guha 2006) At the same time, only the pioneering generic therapy benefits from the large price differential with the alternative (the branded variant) Generics that subsequently enter do not show as large of a price differential anymore, and when they do, the generic pioneer may readily match the lower price, with market shares remaining stable (Hollis 2002) The first generic entrant also typically makes supranormal profits before the entry of a second generic because it provides the only (cheap) alternative for an expensive branded variant (Gupta, Yu, and Guha 2006) Thus

> P_3 Pioneering yields market share advantages for generic therapies

The life sciences industry lends itself well to the examination of order-of-entry effects because entry is well documented (e g , with the FDA Drugs@FDA for the United States) These entry dates can be complemented with IMS Health's dollar sales estimates Moderators that could be considered in such research effort are clinical profile of the treatment (e g , from National Institute for Health and Clinical Excellence or published meta-analyses in scientific journals) and marketing support (commonly available from firms such as IMS Health, Kluwer, or Verispan)

Firms typically do not launch a new treatment simultaneously across the globe Rather, they use specific launch sequences, often driven by a country's regulatory system, economic wealth, and size (Danzon, Wang, and Wang 2005, Kyle 2007, Verniers, Stremersch, and Croux 2008) Differential launch timing across countries has been shown not to affect unit sales (Stremersch and Lemmens 2009), though it has been shown to affect launch price (Verniers, Stremersch, and Croux 2008) In the life sciences industry, launch price is rarely a market price, rather, it is often an agreed-on price between the supplier and the government or insurance firm, which acts as a (co)payer In such negotiations, entry timing may be used by both the payer and the firm as an instrument to affect the agreed-on price

An important contingency factor that has not received any attention is the role of cross-country influence in launch sequencing Often, this cross-country influence is institutionalized because payers will use the price of a therapy in a defined set of other countries (the "referent" countries), if available, as a reference price for the negotiations in their own country (the "referencing" country) Such regulation incentivizes companies to avoid spillover effects (Hunter 2005) Thus

> P_4 Firms that launch a new therapy in a referencing country early relative to the set of referent countries obtain a higher price than firms that launch a new therapy in a referencing country late relative to the set of referent countries

To test this proposition, regulatory data can be gathered from Urch Publishing and the Organisation for Economic Co-operation and Development, both of which track international regulatory health systems (including identification of the set of referent countries for each referencing country), and integrated with IMS Health data on international prices and introduction dates It is also possible to include firm effects (firms may have differential policies, depending on their home market or size) or therapy effects (payers across countries may have differential price and market access policies for different therapy classes) In addition, diffusion studies can deliver valuable and complementary insights into launch decisions Examples of such valuable inquiries that may inform launch decisions are improved models of physician learning and international diffusion studies

Key opinion leader selection Life sciences firms often stimulate reviews of their therapy by select key opinion leaders because such leaders may serve as product champions to their peers The effect of such opinion leaders on other physicians' prescriptions can be large when considerable uncertainty exists (e g , a change in the regulation or the introduction of a new therapy) or when physicians experience normative pressures (e g , there is strong formulary adherence) (Coleman, Katz, and Menzel 1966, Iyengar, Valente, and Van den Bulte 2008) For example, Nair, Manchanda, and Bhatia (2006) show that the effect of opinion leader prescriptions is 100 times larger than the detailing effect on regular physicians after the market underwent a change in National Institutes of Health guidelines

However, we cannot take the positive role of opinion leaders for granted (e g , Van den Bulte and Lilien 2001), and further research should inventory the contingencies that affect the role of opinion leaders In such research, it is worthwhile to consider two types of key opinion leaders with potentially differential effectiveness clinical and market leaders Clinical leaders are experts within the respective disease and therapy class with a strong reputation, as evidenced by their publication records in top-ranked medical journals They are typically involved in premarket product testing and have cooperated with the firm to reduce clinical uncertainty of the therapy In contrast, market leaders are tightly connected to the local patient and physician communities They are typically general practitioners with large practices who gain recognition by the satisfaction and loyalty of their patients They deliver key experiential messages on the therapy to their peers

For example, as a contingency factor, consider whether uncertainty manifests in terms of effectiveness or side effects of a life sciences therapy The impact of uncertainty on effectiveness can be reduced through quantitative assessments without much detail on specific physician practices (i e , large scale, study based) Conversely, the impact of side effects information is more qualitative and dependent on the specific composition of a practice (i e , case based) Because clinical leaders support quantitative assessments of effectiveness and market leaders share case detail on side effects from practices similar to other physicians, we propose the following

- P_{5a} The greater the uncertainty on therapy effectiveness, the higher is the impact of clinical leaders, compared with market leaders, on other physicians' prescription behavior
- P_{5b} The greater the uncertainty on therapy side effects, the higher is the impact of market leaders, compared with clinical leaders, on other physicians' prescription behavior

Another contingency factor to consider is the physician's institutional setting Hospitals have formal ethical guidelines (Gallego, Taylor, and Brien 2007) to which an individual practitioner must adhere, which increases the return on legitimacy compared with general practitioners Clinical leaders enhance legitimacy to a greater degree than market leaders, which fits with their high impact on formulary decisions At the same time, market leaders achieve their influence through similarity of practice In general, the practice of a market leader is more similar to a general practitioner practice than to a hospital-based practice Thus

- P_{6a} Clinical leaders have a greater impact on hospital-based physicians' prescription behavior than market leaders
- P_{6b} Market leaders have a greater impact on general practitioners' prescription behavior than clinical leaders

Researching these propositions can include surveying all physicians of a certain area to inventory their opinion leaders, including Likert-type scales on each of the identified leaders regarding the extent to which they are clinical and/or market leaders

Therapy Promotion

Sales force management A first decision area in therapy promotion is sales force management Visits by the sales force of life sciences firms to physicians are referred to as "detailing" Much academic research has emerged on the effectiveness (return on investment) of detailing (Azoulay 2002, Berndt et al 1995, Leeflang, Wieringa, and Wittink 2004, Manchanda and Chintagunta 2004, Manchanda, Dong, and Chintagunta 2004, Manchanda and Honka 2005, Manchanda, Rossi, and Chintagunta 2004, Mantrala, Sinha, and Zoltners 1994, Mizik and Jacobson 2004, Narayanan, Desiraju, and Chintagunta 2004, Narayanan, Manchanda, and Chintagunta 2005, Parsons and Vanden Abeele 1981, Venkataraman and Stremersch 2007) We derive the following generalization from this literature·

- G_4 The mean effect of detailing on brand prescriptions is (a) positive but (b) small

"Mean" in G_4 refers to the mean across brands and physicians Prior literature has shown high physician- and drug-level heterogeneity, including some brands and physicians showing a negative return on detailing (Leeflang, Wieringa, and Wittink 2004), and has investigated specific contingency factors, such as drug characteristics (e g , side effects, effectiveness [Venkataraman and Stremersch 2007], and physician traits [e g , Gonul et al 2001])

There is room for further study A first opportunity is to increase the reliability of this preliminary generalization through meta-analysis Kremer and colleagues (2008) offer a first attempt at such generalization, but they provide only a limited number of significant moderators and omit drugs' clinical profile A second opportunity lies in the development of models that allow for policy experiments Although we have reliable estimates of the mean effect of detailing, all models are estimated on data that show relatively little policy variance, which inhibits any extrapolation to policy shifts in detailing, either by the manufacturer (many firms are now considering drastically reducing their detailing efforts) or by the regulator (several European countries are considering curtailing detailing) The third opportunity lies in developing physician targeting models based on volume, physician responsiveness to detailing, and competitive detailing patterns (for working papers in this tradition, see Dong, Manchanda, and Chintagunta 2008, Kappe, Stremersch, and Venkataraman 2008)

By far, the most room for novel research seems to be in the content of detailing visits Past and, for most companies, present detailing calls present only favorable information using positively biased information sets—that is, only studies favorable to the brand are presented, or side effects are omitted This sales model seems increasingly dysfunctional, with hospitals and physicians reacting adversely to detailing, even rejecting it altogether, which is symptomatic for the conflicting logics between life sciences firms and the rest of the health care value chain (Singh, Jayanti, and Gannon 2008)

We propose that life sciences firms can gain substantial returns from communicating unfavorable information in their detailing calls, for two main reasons (Leffler 1981) First, in view of their ethical, gatekeeping function to patients, physicians prefer more complete information, even if unfavorable, over ambiguity Second, communicating unfavorable information may enhance the legitimacy of the sales representative and the firm (Singh, Jayanti, and Gannon 2008) In turn, this enhanced legitimacy may deliver sustained physician access and increased trust in the firm's messages Both will strengthen long-term return on investment from detailing Thus

- P_{7a} Communication of complete (including both favorable and unfavorable) therapy information in sales calls may affect more positively the firm's long-term return on investment from detailing than just communicating favorable therapy information
- P_{7b} The effect postulated in P_{7a} is larger in the case of therapies for life-threatening illnesses than in the case of non-life-threatening illnesses
- P_{7c} The relationship postulated in P_{7a} is larger in hospital environments than in outpatient environments

In P_{7b} and P_{7c}, we conjecture that the effect of disclosure of complete information may be contingent on whether the disease is life threatening and on the physician's institutional setting Agents confronted with a decision of high importance attach a greater value to information (Celsi and Olson 1988) Therefore, physicians' preference for more complete information, even if unfavorable, over ambiguity will be higher in the case of life-threatening diseases than in the case of non-life-threatening diseases For example, there is more value in reducing ambiguity about the side effects of chemotherapy, even if it concerns an increased probability of pneumonia versus an increased probability of insomnia caused by antihistamines As we argued previously, practitioners in hospitals may have a higher return on legitimacy than general practitioners in the outpatient environment Revealing unfavorable information together with favorable information enhances a sales representative's legitimacy

There are several possible tests of P_{7a}–P_{7c} IMS Health's U S panel data include data on which attributes of a drug were discussed in a sales call Adding information on how drugs in a category compare on each of these attributes may reveal whether favorable rather than unfavorable attributes were discussed Several individual firms have records on which studies were covered in sales calls, which can reveal whether unfavorable studies were covered The return on investment from long-term detailing can be regressed on both types of data to test the propositions Longitudinal experiments can also be conducted to test the propositions, in which physicians or medical school students are detailed within a simulation

Communication management Although communication efforts of life sciences firms may target both consumers and physicians, the budgets dedicated to the former group are more than ten times larger than the budgets dedicated to the latter (Kremer et al 2008), and from the interviews we held with practitioners, direct-to-consumer advertising (DTCA) is also the most challenging The academic literature on DTCA (Berndt et al 1995, Bowman, Heilman, and Seetharaman 2004, Iizuka and Jin 2005, Narayanan, Desiraju, and Chintagunta 2004, Wosinka 2005) mostly examines overall effectiveness of DTCA and yields the following preliminary generalization

G_5 DTCA has a positive effect on (a) the number of patients seeing a physician for the respective disease for which a therapy is advertised and (b) total category-level demand in the category of the therapy that is advertised

Further research on other potential outcomes of DTCA, such as its effect on brand choice, would be fruitful because it is fraught with debate Iizuka and Jin (2005) and Wosinska (2005) find that DTCA does not affect drug brand choice, while Berndt and colleagues (1995) and Narayanan, Desiraju, and Chintagunta (2004) find a positive effect of DTCA on drug brand choice Such research could involve meta-analysis or the analysis of contingency frameworks

An example of a contingency factor is the degree to which DTCA messages include favorable and unfavorable information Although unfavorable information (e g , information on serious side effects of therapy) may arouse consumers (Moorman 1990), it may also yield negative emotions that hinder information processing (Agrawal, Menon, and Aaker 2007, Keller 1999) Thus

P_8 The effect of DTCA on brand-level demand is higher the more the advertisement depicts favorable, rather than unfavorable, therapy information

At the same time, no study develops a process view on the effects of DTCA on the demand for a specific therapy The process involves DTCA triggering a patient's request for a therapy at the physician's office, which the physician can accommodate or not The role of patient requests and the factors that affect the degree to which the physician accommodates them are not addressed in the academic literature at this point (for an exception, see Venkataraman and Stremersch 2007) Developing such a process view may yield relevant insights for managers (e g , on audience targeting) As an example, consider audience gender Prior research has shown that women are more concerned about their health (Verbrugge 1985) and interact more assertively in health care settings (Kaplan et al 1995) than men and that physicians are more empathic to female than male patients (Hooper et al 1982) Consequently, DTCA may more easily trigger requests among women, and female requests may be more easily accommodated by physicians than male requests Thus

P_9 The effect of DTCA on brand-level demand is higher among female viewers than among male viewers

Many other boundary conditions can be formulated on aspects such as the type of disease and patient–physician relationships, all of which may inform ad content and target audience decisions of firms Data availability on DTCA is high Secondary data sources include ACNielsen and TNS Media Both data types can be connected with aggregate-level sales data (e g , from IMS Health) or panel-level data (e g , from IMS Health or Verispan) In addition, experimental studies may have high potential because they may reveal underlying psychological processes

Stimulating patient compliance As our survey results show, life sciences firms undervalue the importance of stimulating patient compliance, from both a patient welfare and a profit perspective Our interviews with managers revealed that they consider their impact on patient compliance minimal, though they believe that it is mostly affected by the provider in his or her interaction with the patient In contrast, our survey among providers and payers shows that they believe that life sciences firms' efforts to stimulate patient compliance may have important effects on patient welfare

Despite its high relevance, academic research has not studied the role of the life sciences firm in patient compliance in depth Prior research has found that provider expertise (Dellande, Gilly, and Graham 2004), the attitudinal homophily between patient and provider (Dellande, Gilly, and Graham 2004), the frequency of contact between patient and provider (Bowman, Heilman, and Seetharaman 2004), reminder messages (Becker and Rosenstock 1984, Rosenstock 1985), and the burden of therapy (Kahn et al 1997, Kahn and Luce 2003, 2006) all affect patient compliance The only research that exists on how life sciences firms may affect patient compliance examines warning labels For example, Ferguson, Discenza, and Miller (1987) find that warning labels that include information on the consequences of poor compliance are effective

Today, life sciences firms sporadically institute new types of compliance programs, the effectiveness of which remains void of academic scrutiny We categorize such compliance programs in technology-enabled and customer relationship management– (CRM-) enabled programs

Such CRM-enabled programs typically used in practice are direct mail or call campaigns Pfizer has developed a "Staying on Track" CRM program for its statin drug Lipitor (Arnold 2004) Such programs monitor patients' disease and refill status, motivate patients to stay on therapy regimen, and provide patients with therapy risk–related information tailored to the stage of therapy with their specific symptoms and motivations (Hopfield, Linden, and Tevelow 2006)

Technology-enabled programs include a technological device to remind patients to take their pills Bang & Olufsen Medicon's blister card–based "The Helping Hand" gives a visual indication of therapy compliance through red or green LEDs (light-emitting diodes) as soon as a blister is inserted into the device Another example is "SIMPill," a smart pill bottle that reminds patients through SMS (short message service) that they have forgotten to take their medicine

Both types of programs connect to different behavioral rationales for poor compliance a patient's belief in self-efficacy and mindfulness A patient's belief in self-efficacy refers to the belief of being capable of carrying through the prescribed therapy, and mindfulness refers to awareness of actions to be taken (Keller 2006) Customer relationship management–enabled programs promote a patient's belief in self-efficacy, and technology-enabled programs promote mindfulness The potential of CRM programs to promote mindfulness is limited because the reminder frequency within a CRM program is unable to match therapy frequency (one or multiple therapy occurrences a day) Conversely, technology programs cannot offer the patient interpersonal coaching (e g , Bandura 1982) to stay on therapy

Given their differential behavioral rationales, the effectiveness of both programs is likely to depend on factors such as disease complexity and symptom salience First, the more complex a disease, the higher is the likelihood that poor compliance is driven by disbelief in self-efficacy As such, CRM-enabled programs can effectively reduce such uncertainty, but technology-enabled programs cannot Second, the less salient the symptoms of a disease (e g , the flu is a disease with salient symptoms and high cholesterol is a disease with low salience), the more compliance will be driven by mindfulness When salience is low, technology-enabled programs will be more effective in stimulating compliance than CRM-enabled programs

P_{10a} As disease complexity increases, CRM-enabled compliance programs increase in effectiveness to stimulate patient compliance, compared with technology-enabled compliance programs

P_{10b} As symptom salience decreases, technology-enabled compliance programs increase in effectiveness to stimulate patient compliance, compared with CRM-enabled compliance programs

Further research might consider a broader array of contingency factors than those developed in these propositions Such research promises to be impactful for both academia and practice, but at the same time, it is challenging to execute Relatively few firms have instituted a compliance program, patient-level data are difficult to obtain, and patients self-select into a program (which may cause sample selection issues) One method may be to conduct a conjoint experiment using physicians as informants on patient behavior In such a conjoint experiment, program design factors could be manipulated, and their effect on patient compliance (as informed by the physician) could be estimated Test–retest reliability and comparison with actual cases could further support the validity of such an approach A more demanding alternative is cooperation with a life sciences firm that is open to a field experiment, including a longitudinal survey to the compliance program participants More generally, the field of compliance would benefit from extensive survey research across patient–physician relationships because compliance is intrinsically embedded in this relationship

Conclusion

Some industries require industry-specific knowledge development because they have unique characteristics that yield specific challenges for marketers In this research, we aim to advocate such knowledge development for life sciences marketing This article has implications for both life sciences marketing practice and academia

Life Sciences Marketing Practice

Defining life sciences—to our surprise, no useful definition existed in the literature—proved to be challenging but, at the same time, eye-opening Discerning clear boundaries to the domain enabled us to demarcate boundary areas, such as cosmetics-, device-, and food-based therapies, while integrating pharmaceuticals, biotechnology, and medical devices With an increasing patient-centered view on health and personalization in medicine (see Camacho, Landsman, and Stremersch 2009), life sciences companies that develop an integrated view on patients' health—rather than considering themselves a pharmaceutical, biotech, or medical devices company—will be best equipped for the future Such integration is challenging For example, with its historical structure along product divisions, Philips is challenged to develop an integrated view on opportunities in personalized medicine because such opportunities often stretch across the firm's personal care, medical devices, and consumer electronics divisions Another related challenge for life sciences firms is to enhance their typical curative offering to include prevention, patient monitoring, and patient wellness For example, firms with a diabetes franchise have moved historically from providing therapies (e g , glucose) to providing monitoring devices (e g , blood monitoring personal digital assistants) and, more recently, have faced the challenge to move into comprehensive care, which extends toward patient wellness (e g , prevention and awareness on probable consequences of diabetes, such as blindness and wound care)

We also found substantial divergence in the evaluation of the importance of certain decision areas between life sciences marketers and health care payers and providers or, alternatively worded, between profits and patient welfare While marketing managers emphasize the profit implications of sales force management, health care payers and providers emphasize patient welfare implications of life sciences firms' actions to stimulate patient compliance Such divergence gives rise to potential conflict in the health care value chain As Singh, Jayanti, and Gannon (2008) argue, there is a strong need for the life sciences industry to escape such conflicting logic in the short run and increasingly adopt a partnership model, which could lead to enhanced legitimacy in the long run for life sciences firms

Although further testing is needed, the generalizations and propositions we derive may provoke some firms to alter their marketing approach For example, our propositions on opinion leaders encourage a dual-layer strategy of firms, such that at launch, they may rely on clinical leaders (mostly through research cooperation), and as experience with the therapy's side effects grows, market leaders may be actively involved (e g , through specialized detailing) Although some firms already have such a dual-layer strategy, this is not (yet) common practice among life sciences firms Another example is the differentiation between CRM-enabled and technology-enabled compliance programs As the quotation from a Johnson & Johnson marketer in Table 1 shows, most life sciences firms are just beginning to consider compliance programs Our propositions on compliance should encourage them to analyze the underlying characteristics of the disease and the patients to steer them to a suitable type of program The review of prior research and the generalizations we derive from it may also inform practice The positive expectations of many firms regarding the effect of DTCA on brand sales (note the high spending on DTCA among life sciences firms) are unrealistic in light of prior research findings

Life Sciences Marketing Academia

This article shows that a bright future for this nascent field within marketing is imminent (Stremersch 2008) Among the many reasons are that (1) this context presents unique and often challenging problems, (2) for which high-quality data are available and (3) that have an impact that transcends the problems typically investigated by marketing scholars On the supply side, universities are likely to invest considerable research funds in life sciences marketing as a research program that transcends various schools (business, medicine, economics), creates vast societal influence (regarding public policy, firms, the press, and the public at large), and does not have a pure for-profit nature (compared with other business school research)

We have demarcated the boundaries of this new domain, categorized the main decisions of life sciences marketers, and provided generalizations, propositions, and research directions to stimulate and steer research in this nascent field As with the advent of any new field, there are as many cynics who claim that nothing is fundamentally different about life sciences marketing and that conventional insights can easily be extended to such markets without adaptation as there are enthusiasts who embrace these markets as being as different as the moon is from the earth The former group often finds a dominant argument in the data-driven nature of the original contributions to life sciences marketing However, in itself, this is not a reason an industry cannot be guided by different principles, thus leading to unique challenges The same applies to the argument that some challenges are also present in other industries, in a slightly modified form In the dialectic tradition, we try to build the case for the enthusiasts Early interest at conferences, in journals, and in MBA program offices seems to favor the enthusiasts The least we have hopefully achieved with this article is to define the playing field on which cynics and enthusiasts will interact, both in research and in teaching

APPENDIX A
Overview of Life Sciences Marketing Literature

Authors	Decision Areas	Main Findings	Conceptual Framework	Method Used	Empirical Base
Therapy Creation					
Sorescu, Chandy, and Prabhu (2007)	IAF	Pharmaceutical firms with large product capital assets are better at selecting targets with innovation potential and deploying this innovation potential The performance consequences of this superiority in the selection and deployment of target firms manifests itself in long-term financial rewards to the acquiring firm	Resource-based view of the firm	Ordinary least squares (OLS) regression model	238 acquisitions in 7 countries (1992–2002)
Chandy et al (2006)	TPO	Firms that (1) focus on a moderate number of ideas in areas of importance and in which they have expertise and (2) deliberate for a moderate length of time on promising ideas have the highest conversion ability	Problem solving	Discrete choice model	322 drug ideas by 38 firms (1980–1985)
Prabhu, Chandy, and Ellis (2005)	IAF	Innovation outcomes of acquisitions are driven by the preacquisition knowledge of the acquirer and its similarity with the target's knowledge	Knowledge-based view of the firm	Distributed-lag model	35 pharmaceutical firms that acquired 157 targets (1988–1997)
Moorman, Du, and Mela (2005)	TP	Firms can make strategic use of regulation by thinking about costs and benefits of regulation relative to competition The introduction of the Nutrition Label and Education Act (NLEA) (Public Law 101-535) led to (1) an increase in small-share firm exits and (2) a greater increase in distribution for large-share firms No concurrent increase in price by large-share firms following the NLEA was observed	Economics of information	Random effects probit on longitudinal quasi-experimental data	Universal Product Codes at the firm and brand levels for 109 categories from 2186 firms (Supermarket Review data) and for 265 categories from 29,374 firms (Infoscan) per year (1991, 1993, and 1995)
Wuyts, Dutta, and Stremersch (2004)	IAF	Alliance portfolio technological diversity has a positive affect on incremental and radical innovation output but has a negative direct effect on profitability Repeated partnering has a positive effect on radical innovation and a curvilinear effect on profitability Alliance portfolio size has a positive effect on incremental innovation output and firm profitability	Knowledge-based view of the firm	Negative binomial and OLS regression model	991 R&D agreements (1985–1998)
Sorescu, Chandy, and Prabhu (2003)	TPO	Firms that provide higher per-product levels of marketing and technology support obtain much greater financial rewards from their radical innovations than other firms Firms that have greater depth and breadth in their product portfolio also gain more from their radical innovations	Risk- and resource-based view of the firm	Random effects Poisson model	255 breakthroughs introduced by 66 publicly traded firms (1991–2000)

APPENDIX A
Continued

Authors	Decision Areas	Main Findings	Conceptual Framework	Method Used	Empirical Base
Moorman and Slotegraaf (1999)	TP	Product marketing and technology capabilities coinfluence the degree to which firms improve the quality of their brands and the speed of these improvements Capabilities' most valuable characteristic is to serve as flexible strategic options consistent with a changing environment	Resource-based view of the firm and economics of information	Regression on longitudinal quasi-experimental data	124 brands across 22 categories (1991–1993, 1994–1996)
Moorman (1998)	TP	Marketers respond to the introduction of the NLEA by changing the quality of their brands and extensions, thus occupying distinct strategic positions It also shifts healthy brands away from competing on price Conversely, nonhealthy brands rely more on price promotion post-NLEA	Economics of information	Regression on longitudinal quasi-experimental data	269 consumers pre-NLEA, 212 post-NLEA, 124 products (1987–1996)
Therapy Launch					
Aboulnasr et al (2008)	GMET	The likelihood of competitive product response to radical innovation is substantially higher when the introducing firm is large or when it derives a larger part of its revenues from the introduction market The response is greatest when the radical innovation is introduced in a small market by a large firm	New product growth	Hazard model	52 radical product innovations introduced by 32 different companies in 27 therapeutic categories (1997–2001)
Rao, Chandy, and Prabhu (2008)	GMET	New biotech ventures that acquire legitimacy externally by forming alliances with established firms gain more from their new products than new ventures that do not form such alliances Among new ventures that do not form alliances, those that acquire legitimacy internally by creating a history of product launches or by hiring reputed executives or scientists gain more from their new products than those that do not Pursuit of external legitimacy by firms that already have internal legitimacy leads to lower rewards to innovation	New product growth	Maximum likelihood estimation and OLS regressions	93 FDA-approved biotech product introductions (1982–2002)
Akçura, Gonul, and Petrova (2004)	GMET	Price promotions may be deficient as a tool to increase market share in over-the-counter leg-and-back pain relievers	Choice behavior with learning	Bayesian learning model with Kalman filter	3519 purchase observation in panel of 69 consumers of over-the-counter leg-and-back pain relievers (1993–1995)
Desiraju, Nair, and Chintagunta (2004)	GMET	Developing countries have lower diffusion speeds than and maximum penetration levels relative to developed countries Laggard developed countries have higher speeds Laggard developing countries do not have higher diffusion speeds Per-capita expenditures on health care have a positive effect on diffusion speed (particularly for developed countries) Higher prices tend to decrease diffusion speed	New product growth	Hierarchical Bayesian diffusion model	Newly launched antidepressant drugs in 15 countries (1987–1993)

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Authors	Decision Areas	Main Findings	Conceptual Framework	Method Used	Empirical Base
DeSarbo et al (2001)	GMET	The specialist-physician population can be split into three segments with respect to the stage of adoption of innovations in a therapeutic category	Market information mapping	Latent structure spatial model	Top 7 brands prescribed among 258 specialists
Shankar, Carpenter, and Krishnamurthi (1999)	GMET	Growth-stage entrants reach their asymptotic sales level faster than pioneers or mature-stage entrants They are not hurt by competitor diffusion and enjoy a greater response to perceived product quality than pioneers and mature-stage entrants Pioneers reach their asymptotic sales levels more slowly than later entrants Mature-stage entrants are most disadvantaged Buyers are most responsive to pioneer marketing efforts	New product growth	Dynamic brand sales model	29 ethical brands in 6 therapeutic areas (1970s, 1980s)
Shankar, Carpenter, and Krishnamurthi (1998)	GMET	Compared with pioneers or noninnovative late movers, innovative late movers can create a sustainable advantage by enjoying higher market potential and higher repeat purchase rates They grow faster than the pioneer, slowing the pioneer's diffusion and reducing the pioneer's marketing effectiveness They are advantaged asymmetrically, their diffusion can hurt other brands' sales, but their sales are not affected by competitors Noninnovative late movers face smaller potential markets, lower repeat rates, and less marketing effectiveness than the pioneer	New product growth	Generalization of the Bass diffusion model for brand sales	13 ethical brands in 2 chronic ailment therapeutic categories (1970s, 1980s)
Shankar (1997)	GMET	A pioneer that adopts a follower (leader) role with respect to a marketing-mix variable in a static (growing) market and witnesses a decrease (increase) in own elasticity and margin after a new entry should accommodate (retaliate) in that variable	New product growth	Game theory	Full category of chronic care ethical drugs (1970s, 1980s)
Therapy Promotion					
Chintagunta and Desiraju (2005)	SFM	There is considerable heterogeneity in preferences and market response for pricing and detailing across markets, which favors a regional approach to strategy The effects of within- and across-market interactions vary across markets and across brands within a market	Competitive marketing-mix interactions	Category sales and market share model	Antidepressant sales (1988–1999)
Wosinska (2005)	CM, SPC	The impact of DTCA on patient compliance is small in economic terms, the effect spills over to other brands, and in certain cases the effect may decrease average compliance rates	Compliance behavior	Negative binomial model	Panel of 16,011 patients, 123,736 gaps between prescriptions (1996–1999)

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Authors	Decision Areas	Main Findings	Conceptual Framework	Method Used	Empirical Base
Bowman, Heilman, and Seetharaman (2004)	CM, SPC	Mindfulness is a predictor of patient compliance Patients are most at risk for noncompliance right after and some duration after a medical treatment Satisfaction with efficacy is a better predictor of compliance than satisfaction with side effects or costs Advertising shows a mixed influence Direct channel shoppers are more compliant than indirect channel consumers	Compliance behavior	OLS regression and Tobit models	6238 patients making 44,345 purchases (2001–2002)
Manchanda, Rossi, and Chintagunta (2004)	SFM	High-volume physicians are detailed to a greater extent than low-volume physicians without regard to responsiveness to detailing Unresponsive but high-volume physicians are detailed the most	Prescription behavior	Hierarchical Bayesian estimation of negative binomial model	Monthly prescription volume of 1000 U S physicians for one drug, the name of which is not revealed (1999–2001)
Narayanan, Desiraju, and Chintagunta (2004)	SFM, CM	DTCA and detailing affect pharmaceutical demand synergistically Detailing raises price elasticity and has a higher return on investment than does DTCA The interaction between price and detailing is negative DTCA has a significant effect on category sales, but detailing does not Both detailing and DTCA affect brand shares, and detailing has a much greater effect than DTCA	Prescription behavior	Category sales and market share model	Monthly antihistamine prescriptions in the United States (1993–2002)
Gonul et al (2001)	SFM	Physicians show fairly limited price sensitivity Detailing and samples have a mostly informative effect on physicians Physicians with a relatively large number of Medicare or health management organization patients are less influenced by promotion than other physicians	Prescription behavior	Latent class multinomial logit model	1785 patient visits to 157 physicians in the United States for a chronic condition common among the elderly (1991–1994)
Ahearne, Gruen, and Jarvis (1999)	SFM	Perceived salesperson attractiveness has a significant, positive effect on salesperson performance, but the effect diminishes as the length of the salesperson–physician relationship increases Attractiveness leads to higher levels of perceived communication ability, likability, expertise, and trustworthiness	Social psychology	Regression analysis on survey data	339 U S physicians
Dekimpe and Hanssens (1999)	SFM, CM	Strategic scenarios (business as usual, hysteresis in response, escalation, and evolving business practice) have a major impact on marketing effectiveness and long-term profitability Multivariate persistence measures are proposed to identify which of four scenarios is taking place	Marketing strategy response	Vector autoregressive models	Monthly sample of five years for a pioneering and challenger brand in one pharmaceutical category in the United States

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Authors	Decision Areas	Main Findings	Conceptual Framework	Method Used	Empirical Base
Hahn et al (1994)	CM	Effectiveness of communication on product trial is related mainly to product quality and market growth Effectiveness of word of mouth is associated with product class characteristics and market competitiveness The effect of product trial on repeat purchases is related to product quality and market characteristics, such as size, growth, competitiveness, and familiarity	New product growth	Four-segment trial-repeat model	21 ethical drugs in 7 therapeutic categories, launched from 1981 to 1984
Mantrala, Sinha, and Zoltners (1994)	SFM	The agency theoretic model–based approach can assist management in evaluating and optimally structuring multiproduct sales quota bonus plans	Agency theory	Utility model on conjoint data	12 sales people in a single company
Parsons and Vanden Abeele (1981)	SFM	Sales call elasticity varies over time as a function of the collateral material (samples and handouts)	Marketing strategy response	OLS regression model	Monthly sales for an established drug within the steroid group of prophylactic medicines for women in Belgium (1973–1974)

Notes Decision areas CM = communication management, GMET = global market entry timing, IAF = innovation alliance formation, SFM = sales force management, SPC = stimulating patient compliance, TP = therapy positioning, and TPO = therapy pipeline optimization Note that no research was published (yet) on key opinion leader selection in the five major marketing journals we studied

APPENDIX B
Overview of Health Psychology Literature

Authors	Main Findings	Conceptual Framework	Data Type	Empirical Base
Berger and Rand (2008)	In the context of alcohol and junk food consumption, associating risky health behavior with a social identity people do not want to signal can lead consumers to make more healthful choices.	Health-related behavior	Experiments	50 undergraduate students 87 resident college students 75 college students
Bolton et al. (2008)	Consumer belief that a drug alone will take care of a health risk creates a boomerang effect in drug marketing by undermining intentions to engage in health-protective behavior. This is because (1) drugs reduce risk perceptions and perceived importance of complementary health-protective behavior, as well as the motivation to engage in such behavior, and (2) drugs are associated with poor health, which reduces self-efficacy and perceived ability to engage in complementary health-protective behavior. A combined intervention accompanying a drug remedy that targets both motivation and ability mitigates the drug boomerang on a healthful lifestyle.	Health communication and health-related behavior	Experiments	185 patients at risk of high cholesterol 81 staff and college students 213 staff and college students
Hong and Lee (2008)	Regulatory fit, experienced when a person's strategy of goal pursuit fits with his or her regulatory focus (promotion or prevention based), enhances self-regulation toward desirable outcomes through intensified motivation. Regulatory nonfit impairs self-regulation by reducing motivation.	Health-related behavior	Experiments	48 undergraduate students 64 university participants 182 MBA students 228 undergraduate students
Riis, Simmons, and Goodwin (2008)	An examination of the willingness of young, healthy people to take drugs intended to produce psychological enhancement found that people were much more reluctant to enhance traits believed to be more fundamental to self-identity (e.g., social comfort) than traits considered less fundamental to self-identity (e.g., concentration ability). People were more inclined to ban enhancements that were morally unacceptable.	Health-related behavior	Experiments	357 undergraduate students 176 undergraduate students 90 undergraduate students 359 undergraduate students 500 participants ages 18–45
Wong and King (2008)	Risk understanding in the context of breast cancer is influenced by the dominant illness narrative of restitution within Anglo-Western cultures. Restitution stories reflect the cultural values of personal responsibility and taking control in fighting disease and returning to a normal life. Restitution promotes early detection, aggressive treatment, and reconstructive surgery as concealment. This risk understanding contributes to the consumption of health care interventions exceeding U.S. medical guidelines.	Health risk perception	Phenomenological interviews	12 participants diagnosed with breast cancer
Agrawal, Menon, and Aaker (2007)	When people are primed with a positive emotion (e.g., happiness, peacefulness), the compatibility between the referent and the discrete emotion fosters the processing of health information. When the primed emotion is negative (e.g., sadness, agitation), compatibility hinders processing of the message.	Health communication	Experiments	80, 103, 188, and 98 undergraduate students

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Authors	Main Findings	Conceptual Framework	Data Type	Empirical Base
Bolton, Cohen, and Bloom (2006)	Remedy (e.g., smoking cessation aids) messages undermine risk perceptions and increase risky behavioral intentions as consumer problem status rises (i.e., among those most at risk)	Health communication and health risk perception	Experiments	97 college students 99 people 72 university/hospital staff and students
Keller (2006)	A person's regulatory focus determines the salience of self-efficacy (perceived ease) or response efficacy (perceived effectiveness) of health behaviors. There are greater regulatory–efficacy fit and higher intentions to perform the advocated behaviors when self-efficacy features are paired with promotion focus and when response efficacy features are paired with prevention focus. Self-efficacy is weighed more than response efficacy when the regulatory focus is promotion, whereas the reverse is true in prevention regulatory focus	Health-related behavior	Experiments	60 undergraduate students 61 middle school adolescents
Thompson (2005)	Dissident health risk perceptions are culturally constructed in the natural-childbirth community, are internalized by consumers as a compelling structure of feeling, and are enacted through choices that intentionally run counter to orthodox medical risk management norms	Health risk perception	Phenomeno-logical interviews	10 couples of a natural-childbirth community
Chandran and Menon (2004)	Everyday, health hazard framing makes risks appear more proximal and concrete than every-year framing, resulting in increased self-risk perceptions, intentions to exercise precautionary behavior, concern and anxiety about the hazard, and effectiveness of risk communication	Health communication and health risk perception	Experiments	46, 64, and 153 undergraduate students
Dellande, Gilly, and Graham (2004)	In the context of a weight-loss clinic, provider expertise and attitudinal homophily play a role in bringing about customer role clarity, ability, and motivation. Compliance leads to goal attainment, which results in satisfaction. Compliance also leads to satisfaction directly, consumers who comply with program requirements have greater satisfaction with the program	Health-related behavior	Survey, archival data, and interviews	376 patients and 36 nurses in Southern California
Moorman et al. (2004)	Subjective knowledge (i.e., perceived knowledge) can affect the quality of consumers' choices by altering where consumers search. Subjective knowledge increases the likelihood that consumers will locate themselves proximal to stimuli consistent with their subjective knowledge. As such, subjective knowledge influences choice by affecting search selectivity between environments rather than search within the environment. The need for self-consistency drives the effect of subjective knowledge on search	Health communication	Experiments and survey	44 people 212 undergraduate students 947 shoppers in 20 product categories
Thompson (2004)	In the natural health marketplace, a nexus of institutional, competitive, and sociocultural conditions engenders different ideological uses of this marketplace mythology by two types of stakeholders: advertisers of herbal remedies and consumers seeking alternatives to their medical identities	Health communication	Ethnographic study	3 advertisements for natural health products

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Authors	Main Findings	Conceptual Framework	Data Type	Empirical Base
Kahn and Luce (2003)	Given a false-alarm result, life-threatening test consequences are associated with more disutility for future testing than when test consequences are less significant This does not hold for normal test results Patients receiving a false-alarm result experienced more stress, were less likely to believe that a positive mammography result indicated cancer, and were more likely to delay mammography than patients receiving normal results, unless they were also told that they may be vulnerable to breast cancer in the future Delays in planned adherence following a false-alarm result can be mitigated by an information intervention	Health-related behavior and health risk perception	Experiments	64 women in a university hospital mammography waiting room
Keller, Lipkus, and Rimer (2003)	In the context of a message on breast cancer risk, people induced with a positive mood are more persuaded by the loss-framed message (the cost of not getting a mammogram), whereas people induced with a negative mood are more persuaded by the gain-framed message (the benefits of getting a mammogram) People in a positive mood have higher risk estimates and lower costs in response to the loss frame than the gain frame, whereas the reverse is true for people in a negative mood	Health communication and health risk perception	Experiments	85 women between the ages of 40 and 70 124 women between the ages of 40 and 70
Spangenberg et al (2003)	Self-prophecy through mass-communicated prediction requests can influence normative behaviors for large target populations	Health communication	Experiments	72 undergraduate students 1665 health and fitness club members 202, 74, and 92 undergraduate students 83 university staff members
Keller, Lipkus, and Rimer (2002)	Compared with nondepressives, depressives lower their risk (of getting breast cancer) estimates such that they are more accurate or closer to the medical estimates provided in risk feedback Nondepressives with higher baseline risk estimates do not revise their follow-up risk estimates, because they are in a positive mood after receiving the risk feedback	Health risk perception	Experiments	55 women between the ages of 40 and 60 74 women between the ages of 25 and 40
Menon, Block, and Ramanathan (2002)	Message cues can reduce self-positivity bias (i e , the tendency for people to believe that they are invulnerable to disease) and engage people in more precautionary thinking and behavior Risk behavior cues in the message affect people's estimates of their vulnerability (self-risk estimates), depth of message processing, attitudes, and behavioral intentions	Health communication and health risk perception	Experiments	137, 110, 160, and 152 undergraduate students
Thompson and Troester (2002)	Natural health consumers use narratives to articulate the values manifested in their wellness-oriented consumption outlooks and practices Narratives reveal the meaning-based linkages between these articulated values and the consumption goals being pursued through natural health practices	Health communication	Phenomenological interviews	32 natural health consumers

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Authors	Main Findings	Conceptual Framework	Data Type	Empirical Base
Luce and Kahn (1999)	In the context of chlamydia and mononucleosis, false-positive outcomes increase perceptions of vulnerability and test inaccuracy, even when test-error base rates are held constant Increased perceived vulnerability appears to be directly related to the testing event because the effects are not replicated by simply asking participants to imagine having the malady False-positive test results increase planned compliance if there are poor alternatives to testing or if the value of test-initiated treatment is high, but they do not affect compliance if good testing alternatives are available or if the treatment value is low The results of a false-positive outcome on compliance are partially mediated by changes in perceived vulnerability and test accuracy	Health-related behavior	Experiments	152, 49, and 129 undergraduate students
Raghubir and Menon (1998)	In the judgment of the risk of contracting AIDS, the perceived similarity of another person and the ease with which related information can be retrieved from memory moderate self-perceptions of risk in an absolute sense and reduce the self-positivity bias Increasing the accessibility of a cause of AIDS—for example, in an advertisement propounding safe sex—increases perceptions of a person's own risk of contracting AIDS, reduces the self-positivity bias, leads to more favorable attitudes and intentions toward practicing precautionary behaviors, and leads to deeper processing of AIDS educational material	Health risk perception and health-related behavior	Experiments	28, 76, 109 undergraduate students
Keller and Block (1997)	There is an inverted U-shaped relationship between resource allocation and persuasion for vivid information and a positive linear relationship between resource allocation and persuasion for nonvivid information when vivid information is less resource demanding than nonvivid information When nonvivid information is less resource demanding than vivid information, there is an inverted U-shaped relationship for nonvivid information and a positive linear relationship for vivid information The contrasting persuasion functions for vivid and nonvivid information can predict when vivid information will be more versus less persuasive than nonvivid information	Health communication	Experiments	120 graduate and undergraduate students 94 undergraduate student smokers 190 undergraduate students
Keller and Block (1996)	In the context of messages prompting smoking cessation, when a low level of fear is ineffective, it is because there is insufficient elaboration of the harmful consequences of engaging in the destructive behavior When appeals arousing high levels of fear are ineffective, it is because too much elaboration on the harmful consequences interferes with processing of the recommended change in behavior	Health communication and health-related behavior	Experiment	97 university students smokers

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Authors	Main Findings	Conceptual Framework	Data Type	Empirical Base
Block and Keller (1995)	In the context of skin cancer and sexually transmitted diseases, the authors show that a low-efficacy condition (i.e., when it is uncertain that following the recommendations will lead to the desired outcome) motivates more in-depth processing. When participants engage in in-depth processing, negative frames are more persuasive than positive ones. A high-efficacy condition generates less effortful message processing when positive and negative frames are equally persuasive.	Health communication	Experiments	94 undergraduate students 115 students
Moorman and Matulich (1993)	The interaction of health ability with health motivation affects consumers' health behaviors. The impact of these characteristics depends on the particular health behavior and the specific health ability characteristic.	Health-related behavior	Experiment	404 consumers
Friedman and Churchill (1987)	In the context of health care delivery, the effectiveness of expert and legitimate social power behaviors—in terms of patient satisfaction, compliance, and action—is contingent on the aspect of the situation that is manipulated. Conversely, high-referent and low-coercive power are preferred by patients regardless of the situation.	Health-related behavior	Experiment	396 female graduate students
Burnett and Oliver (1979)	Response to fear appeals is specific to the situation, topic, person, and criterion. This supports segmenting target consumers by demographic or psychographic traits in the use of fear appeals.	Health communication and health-related behavior	Experiment	1600 people served by a health management organization
Oliver and Berger (1979)	Health belief models incorporating evaluative components, normative influences, emotional factors, and intervening summary concepts may yield a greater understanding of health care decisions.	Health communication	Experiment	332 students and 469 residents

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Gary L. Frazier, Elliot Maltz, Kersi D. Antia, & Aric Rindfleisch

Distributor Sharing of Strategic Information with Suppliers

Distributor sharing of strategic information with suppliers is an important but underresearched issue within the marketing discipline The authors develop and test a conceptual framework based on exchange theory that focuses on the degree to which distributors share external and internal strategic information with associated suppliers Relying on survey data collected from 479 distributors across three industries, the authors find that distributors share strategic information with suppliers according to factors that affect the perceived benefits, costs, and risks of such behavior The sharing of internal strategic information has distinct determinants compared with those of external strategic information The interrelationships between environmental uncertainty and the sharing of internal strategic information, including both main and interactive effects, are especially notable

Keywords exchange theory, dependence, information sharing, channel relationships, uncertainty

According to marketing strategy scholars, a firm's capability to compete largely depends on its ability to obtain information about customer preferences, competitor actions, and channel member behavior (Day 1994, Kohli and Jaworski 1990, Narver and Slater 1990) The marketing channels literature echoes this sentiment and suggests that suppliers heavily rely on distributors for this information because of their direct contact with both competitors and end customers (Coughlan et al 2006, Frazier 1999) Distributors possess information that is difficult, if not impossible, for suppliers to obtain otherwise

However, distributors are often unwilling to share information with suppliers (Alderson 1965, Grabner and Rosenberg 1969) Most distributors carry products from a large number of suppliers and face resource constraints (e g , time and opportunity costs) that hamper information sharing In addition, the benefits of information sharing are often indirect and not clearly evident to the distributor organization (Frenzen and Nakamoto 1993) Moreover, some information may be sensitive in nature and, if shared, could place the distributor at risk of opportunistic exploitation (Sislain and Satir 2000, Wathne and Heide 2000)

Therefore, understanding what leads distributors to share information with suppliers is important to the marketing discipline However, this issue has received scant attention Channel researchers have largely focused on how information sharing affects the nature and quality of the relationship between suppliers and their distributors (Anderson and Weitz 1992, Boyle et al 1992, Ganesan 1993, Morgan and Hunt 1994) Our research extends and enriches this prior literature by examining the factors that lead distributors to share information with their suppliers In essence, while previous work has focused on the effect of information sharing on channel relationships, our research examines the effect of channel relationships on information sharing

This study centers on a particular type of information, "strategic information," which we define as processed and retained data within a distributor organization that have implications for firms' long-range decision making (Lederer and Sethi 1996, Porter and Millar 1985) Our conceptual framework is grounded in exchange theory and is enhanced by prestudy interviews with more than 20 distributors and suppliers We consider two forms of strategic information that may be shared across organizations external and internal We test our conceptual framework with survey data from 479 distributors across three different industries

The results provide considerable support for our conceptualization and offer three key contributions First, this research opens a new area of inquiry for marketing channels by providing an initial investigation of distributor sharing of strategic information Thus, this research establishes a much needed conceptual and empirical baseline for the future Second, the study enriches the marketing strategy domain by underscoring the important role of channel members as a source of strategic information Suppliers that use indirect channels need strategic information from distributors on customers, competitors, and strategic plans to heighten their market orientation (e g , Day 1994, Min and Mentzer 2004) Third, this research provides guidance to managers seeking access to strategic information from channel members

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Conceptual Framework

Strategic Information

Information has been studied across a variety of disciplines and has been classified using a variety of typologies (e g , Daft and Lengel 1986, Huber 1990, Machlup and Mansfield 1983, Nonaka 1994) Within marketing, Glazer (1991, p 2) defines information as "data that have been organized or given structure and thus endowed with meaning" In other words, information is data that have been processed and retained

We focus on strategic information because the collection, dissemination, and integration of market information within and across firms is primarily a strategic rather than a tactical exercise (see Nakata and Sivakumar 1996) Distributors possess two important types of strategic information external and internal Customers and competitors exist beyond the boundaries of a distributor organization Thus, we define "external strategic information" (ESI) as processed and retained data within the distributor organization about customers and competitors that have implications for firms' long-range decision making In contrast, strategic plans are developed by top management within the distributor organization Therefore, we define "internal strategic information" (ISI) as processed and retained data within the distributor organization on future plans that have implications for firms' long-range decision making Both types of strategic information are highly valued by distributors and suppliers alike because they can enhance a firm's competitive advantage (Day 1994)

The distinctions between these two types of strategic information are important Because ISI entails information about a distributor's future plans, it is more sensitive and proprietary in nature than ESI (Sislain and Satir 2000) Thus, from a distributor's viewpoint, there is greater potential for supplier misuse of ISI, which in turn should lead distributors to be more hesitant to share ISI than ESI Furthermore, ISI is legitimately available only from top management within the distributor organization, while ESI can be obtained from other sources (Jaworski and Kohli 1993) Although some common determinants likely exist, we expect that ISI and ESI differ in their antecedents and consequences because of their distinct characteristics

Theoretical Foundation

We rely on exchange theory as the foundation for our conceptual framework because it was designed to explain resource transfers within exchange relationships (Homans 1961, Thibaut and Kelley 1959) Information has long been recognized as an important resource in exchange theory that may or may not be shared across exchange partners (Frenzen and Nakamoto 1993) Exchange theory proposes that from evaluations of past experiences and future expectations, parties consider potential benefits, costs, and risks of alternative behaviors and select the option with the highest expected long-term net benefits (Blau 1964) For a distributor, the perceived benefits of sharing strategic information are enhanced sales and margins from supplier products that better meet the needs of end customers, as well as reciprocated rewards from grateful suppliers (Blau 1964) The perceived costs to the distributor of sharing strategic information are the time and effort associated with this activity (Blau 1964) The perceived risks to the distributor of sharing strategic information are related to the possibility that a supplier will misuse shared information to the detriment of the distributor organization (Williamson 1985)

Our conceptual framework focuses on the factors that are likely to affect distributor perceptions of the benefits, costs, and risks of sharing ESI and ISI (see Figure 1) Drawing from prior research on exchange theory, we concentrate on constructs that are related to the nature of the exchange relationship between the distributor and the supplier (Blau 1964, Frenzen and Nakamoto 1993, Homans 1961) In accordance with prior research in the marketing channels domain, we focus on interdependence, trust, and specialized investments to reflect characteristics of the exchange relationship (Anderson and Narus 1990, Frazier 1983a, Heide and John 1992) Moreover, consistent with exchange theory, we examine a distributor characteristic—distributor product-market familiarity—and an environmental characteristic—environmental uncertainty

Research Hypotheses

Nature of exchange relationship A firm's dependence is its need to maintain a channel relationship to achieve desired goals (Frazier 1983b) In most channel relationships, exchange partners do not share the same degree of dependence (Kumar, Scheer, and Steenkamp 1995) "Dependence asymmetry favoring the distributor" reflects an exchange relationship in which the supplier's dependence is higher than the distributor's dependence, providing a power advantage to the distributor organization (Emerson 1962)

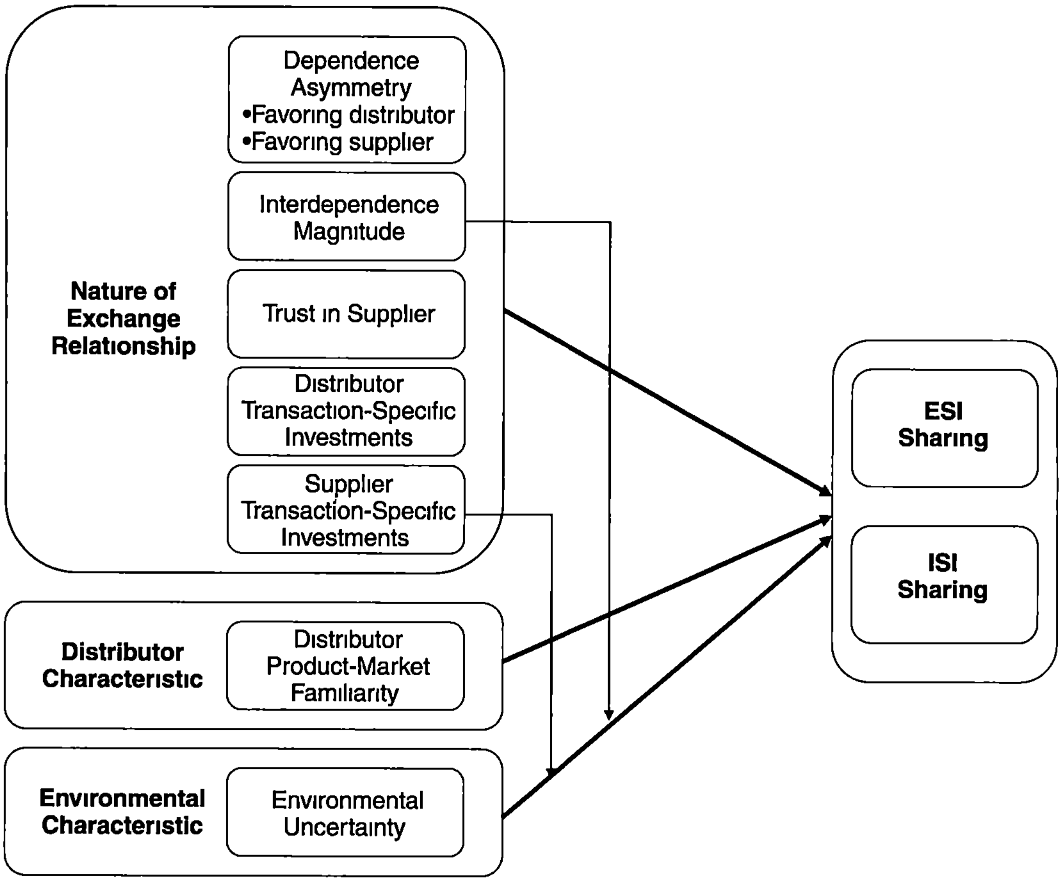
Suppliers that are highly dependent on their distributors have a strong incentive to ensure that the channel relationship prospers over time (Buchanan 1992, Lusch and Brown 1996) Consequently, powerful distributors likely expect that suppliers use shared strategic information to the benefit of the distributor organization Thus, suppliers in such relationships may use both ESI and ISI to enhance the attractiveness of their products to end customers and better meet distributor needs (Day 1994) Distributor benefits should be enhanced as a result

Furthermore, dependent suppliers are less likely to perform acts that damage their distributor (Gundlach and Cadotte 1994) In particular, a high degree of dependence makes it dangerous for a supplier to engage in opportunistic behavior or employ negative tactics because it will have much to lose if the relationship deteriorates (Buchanan 1992, Kumar, Scheer, and Steenkamp 1995) Therefore, distributors with a power advantage in a channel relationship are likely to perceive lowered risks of sharing both ESI and ISI (Jap and Anderson 2003)

> H_1 Dependence asymmetry favoring the distributor leads to more distributor sharing of ESI and ISI

"Dependence asymmetry favoring the supplier" reflects an exchange relationship in which the distributor's dependence is greater than the supplier's dependence Powerful

FIGURE 1
Conceptual Framework


Nature of Exchange Relationship
Dependence Asymmetry
•Favoring distributor
•Favoring supplier
Interdependence Magnitude
Trust in Supplier
Distributor Transaction-Specific Investments
Supplier Transaction-Specific Investments
Distributor Characteristic
Distributor Product-Market Familiarity
Environmental Characteristic
Environmental Uncertainty
ESI Sharing
ISI Sharing

suppliers can pressure distributors to take actions that benefit their firms (Kumar, Scheer, and Steenkamp 1995) This pressure may come in the form of threats to withhold scarce resources if distributors do not comply or, in the worst case, relationship dissolution Furthermore, a powerful supplier can leak sensitive strategic information to other firms (Gaski and Nevin 1985)

Thus, perceived risks of sharing ESI and ISI with powerful suppliers may be high because the supplier could misuse this information to the distributor's detriment To hedge against such risks, distributors may restrict strategic information sharing In all likelihood, a powerful supplier will have difficulty ascertaining the type of strategic information the distributor organization actually possesses, so negative repercussions to the distributor of failing to share strategic information are likely to be low (Coughlan et al 2006) The potential benefits to the distributor of sharing strategic information with powerful suppliers are unlikely to offset the associated risks

H_2 Dependence asymmetry favoring the supplier leads to less distributor sharing of ESI and ISI

"Interdependence magnitude" is the extent to which both the distributor and the supplier are dependent on a channel relationship (Gundlach and Cadotte 1994) When interdependence magnitude is high, each firm is highly dependent on the exchange, and dependence is balanced

High interdependence magnitude reflects an exchange relationship in which the distributor and supplier are highly important to each other and are roughly on equal footing Thus, the commitment of each firm should be high (Morgan and Hunt 1994). Under such conditions, distributors are more likely to share both ESI and ISI Balanced or symmetric dependence relationships tend to be stable and robust in nature and are less likely to dissolve over time, which should enhance distributor benefits (e g , incremental sales) of sharing strategic information (Anderson and Weitz 1989, Heide 1994) Furthermore, the risks associated with information sharing should be lessened because high interdependence makes it unlikely that the channel partners will engage in opportunistic behavior, because both firms have much to lose (Kumar, Scheer, and Steenkamp 1995)

H_3 Interdependence magnitude leads to more distributor sharing of ESI and ISI

"Distributor trust" is the degree to which the distributor has confidence in the supplier's reliability and integrity (Morgan and Hunt 1994) Perceptions of trust build up over time because of actions the supplier takes that demonstrate its honesty and benevolence

Internal strategic information is more sensitive and proprietary than ESI because it entails information about a distributor's long-term plans Furthermore, the supplier can legitimately receive ISI only from the distributor organization (Sislain and Satir 2000) As a result, the distributor is expected to be especially wary of sharing ISI relative to sharing ESI because the potential risks are high Trust in the supplier should mitigate these perceived risks A distributor is likely to view a supplier with high reliability and integrity as unlikely to misuse or leak organizational plans (Frenzen and Nakamoto 1993) Such opportunistic behavior would be incongruent with the supplier's prior efforts to demonstrate its honesty and benevolence

H_4 Distributor trust in the supplier leads to more distributor sharing of ISI

"Distributor transaction-specific investments" (DTSIs) are the nonrecoverable expenditures a distributor makes to support the sales of a supplier's products (Williamson 1985) Distributors make such investments because of the promise they hold for enhanced benefits Because distributors have limited resources, specialized investments must be considered carefully (Buchanan 1992) When DTSIs are made, the distributor has an incentive to protect them to reap additional benefits (Frazier 1983a, Jackson 1985) Distributor sharing of strategic information represents a form of support to the supplier organization The supplier can use ESI and ISI to enhance its competitive offerings and better meet distributor needs, which in turn should lead to greater distributor benefits (e g , the ease of distributor selling efforts is enhanced) (Thibaut and Kelley 1959) Although there may be risks associated with sharing strategic information under such conditions (Williamson 1985), the distributor's desire to protect DTSIs and to enhance potential benefits from the exchange should offset these risks

H_5 DTSIs lead to more distributor sharing of ESI and ISI

"Supplier transaction-specific investments" (STSIs) are the nonrecoverable expenditures a supplier makes to support the sales of its products by a distributor organization (Williamson 1985) They signal a supplier's good faith and willingness to do what is required to support the distributor in selling its products (Buchanan 1992, Rusbult 1980) As Anderson and Weitz (1992, p 21) emphasize, "Observing the other party's pledges causes a channel member to be more confident in the other party's commitment to the relationship " Thus, from a distributor's viewpoint, the risks of ESI and ISI should be attenuated because suppliers are unlikely to jeopardize their STSIs by misusing or leaking strategic information Furthermore, by sharing strategic information, a distributor can exhibit its own commitment to the supplier As a result, relational functioning should improve, with enhanced benefits (e g , reciprocated rewards) to the distributor occurring as a result (Srinivasan and Brush 2006)

H_6 STSIs lead to more distributor sharing of ESI and ISI

A distributor characteristic "Distributor product-market familiarity" is the extent to which a distributor understands the market for a supplier's products (Celly and Frazier 1996, Ozomer and Prussia 2000) Distributors with high product-market familiarity should possess a large amount of ESI to share When the volume, depth, and accessibility of customer and competitor information is high, less time and cognitive effort is required to share such information (Alba and Hutchinson 1987, Thomas 1983) As a result, distributors with high product-market familiarity should be better able to share ESI with their suppliers

H_7 Distributor product-market familiarity leads to more distributor sharing of ESI

An environmental characteristic "Environmental uncertainty" is the degree to which it is difficult to make accurate predictions about the future (Achrol and Stern 1988) Two opposing viewpoints exist regarding the effect of environmental uncertainty on exchange relationships One view posits that when faced with high uncertainty, firms will coordinate their activities more closely in an attempt to reduce uncertainty (Pfeffer and Salancik 1978) The other view argues that firms attempt to maximize their flexibility in uncertain environments by reducing their reliance on individual relationships (e g , Heide 1994) We believe that the merit of these contrasting views varies according to the degree of sensitivity of the strategic information

When environmental uncertainty is high, a distributor may perceive the sharing of ESI as an effective means of attenuating unpredictability (see Pfeffer and Salancik 1978) In particular, ESI should help suppliers interpret the meaning of changing conditions This enhanced sensemaking should improve a supplier's ability to provide the distributor with offerings that align with the shifting nature of the marketplace (Cannon and Perrault 1999) This improved alignment should benefit the distributor in terms of higher sales of the supplier's products and enhanced supplier loyalty and thus should increase its proclivity to engage in ESI sharing

H_{8a} Environmental uncertainty leads to more distributor sharing of ESI

In contrast, when environmental uncertainty is high, a distributor may be reluctant to share ISI because of its sensitive and proprietary nature Suppliers could misuse ISI under such conditions The need for safeguards is greater when environmental uncertainty is high (Williamson 1985) Faced with unpredictability, distributors may attempt to minimize risks and maintain flexibility in their exchange relationships by reducing resource commitments to individual suppliers (e g , Buchanan 1992, Heide 1994) Potential benefits of sharing proprietary planning information may be perceived as limited because the future of the exchange is less predictable (e g , Achrol and Stern 1988)

H_{8b} Environmental uncertainty leads to less distributor sharing of ISI

Moderator effects on the uncertainty–sharing relationships High interdependence magnitude signifies that the channel relationship is essential to the goal attainment of both the distributor and the supplier As a result, these relationships often display a high degree of stability and a real sense of "partnership" (Dwyer, Schurr, and Oh 1987, Pfeffer and Salancik 1978) An interdependent supplier should attempt to make effective use of shared ESI by improving the quality of its products and services to better meet the needs of an uncertain marketplace (see Pfeffer and Salancik 1978) As a result, a distributor is likely to share even more ESI when interdependence magnitude is high to ensure that environmental uncertainty does not hamper the potential benefits being received from an important exchange relationship

> H_{9a} Interdependence magnitude strengthens the positive relationship between environmental uncertainty and distributor sharing of ESI

Relationships characterized by high interdependence magnitude are less likely to deteriorate in highly uncertain environments, and the firms may react as partners to changing conditions Thus, risks of supplier misuse or leaking of distributor ISI should be reduced (Pfeffer and Salancik 1978) The safeguards to sharing ISI offered by a high level of interdependence magnitude may counterbalance the tendency of distributors to reduce risk and maintain flexibility in the face of high uncertainty (e g , Ybarra and Wiersma 1999)

> H_{9b} Interdependence magnitude weakens the inverse relationship between environmental uncertainty and distributor sharing of ISI

Distributor wariness to share ISI under conditions of high environmental uncertainty may also be reduced by the presence of STSIs These investments serve as a signal of a supplier's intention to maintain its commitment to the channel relationship and should lessen the chances that a supplier will misuse or leak sensitive internal information (Anderson and Weitz 1992) As a result, the distributor may be less concerned about sharing proprietary internal information when uncertainty is high because the risks associated with supplier opportunism are likely to be constrained In addition, high STSIs should motivate a distributor to share information about its plans and objectives as a means of improving interfirm coordination and enhancing the potential benefits received from the exchange

> H_{10} STSIs weaken the inverse relationship between environmental uncertainty and distributor sharing of ISI

Research Method

Setting, Sample, and Data Collection

We tested our conceptual framework with data collected from distributors across three different industries medical equipment (North American Industry Classification System code 42145), industrial equipment (code 42183), and industrial supplies (code 42184) We conducted prestudy interviews with more than 20 distributors and suppliers to ground our study From these interviews, we found that suppliers in these industries greatly value the acquisition of strategic information We also found that distributors in these industries deal with many suppliers Thus, for these distributors, sharing strategic information is an important decision that entails significant costs, substantial risks, and unclear benefits Our prestudy interviews also indicated that a distributor's principal owner or general manager is typically responsible for sharing strategic information with its suppliers Thus, we targeted these individuals, one per distributorship, as our respondents

We drew a random sample of 600 distributorships in each industry The screening criteria were sales greater than $1 million and availability of the name of the principal owner or general manager We used prestudy telephone calls to screen for companies that were not distributors, to verify telephone numbers and mailing addresses, and to ensure that the contact individuals were qualified respondents After we excluded distributors that could not be reached or did not qualify, our final sampling frame consisted of 501 medical equipment distributors, 506 industrial equipment distributors, and 454 industrial supplies distributors, for a total of 1461 distributors

We used Dillman's (2000) multistage survey approach to enhance our response rate This process yielded 479 returned surveys, 150 from medical equipment distributors, 162 from industrial equipment distributors, and 167 from industrial supply distributors, for an overall response rate of 33% We compared the sales volume and geographic location for respondents and nonrespondents and found no significant differences We also compared first-wave and second-wave respondents on key study constructs and found no significant differences (Armstrong and Overton 1977) Thus, nonresponse bias appears unlikely

Measure Development

When possible, we employed existing measures However, we found no suitable measures for the sharing of ESI and ISI Thus, we relied heavily on prestudy interviews to develop and refine measurement items We conducted a formal pretest of the survey instrument among 60 randomly selected distributors (20 from each industry) who fit the screening criteria A total of 17 distributors returned completed surveys We used these responses to refine or discard items that appeared problematic The descriptive statistics and correlation matrix for our measures appear in Table 1 Unless otherwise noted, we used five-point Likert scales to assess our measures Our final survey instrument began by asking respondents to select a product category their distributorship carried We then instructed them to select an important supplier in this category and to keep this supplier in mind throughout the survey

To measure distributor sharing of strategic information, we focused respondents' attention on strategic discussions during the previous year (either by telephone or in person) between themselves and upper management of the supplier on issues of long-term significance We view the sharing of ESI as a higher-order construct comprising two first-order dimensions The customer information dimension consists of three items regarding customer feedback on major product innovations, major changes in the delivery system, and major improvements needed in product quality (α = 61) The competitor information dimension consists of five items focused on long-term changes in the distributor's trade area on a competitor going out of business, increased competition, product innovations by the supplier's competi-

TABLE 1
Descriptive Statistics and Correlation Matrix

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 ESI sharing	3 27	74																
2 ISI sharing	3 55	74	50*															
3 Supplier dependence	3 65	80	25*	21*	70													
4 Distributor dependence	3 30	50	07	−02	14*	91												
5 Distributor familiarity	4 31	60	24*	18*	33*	01	70											
6 Distributor investments	3 73	91	33*	21*	27*	09*	30*	80										
7 Supplier investments	3 14	1 02	21*	22*	27*	12*	16*	33*	79									
8 Trust	3 36	97	−04	15*	25*	−02	10*	−04	35*									
9 Environmental uncertainty	2 49	58	00	−16*	−21*	00	−12	03	−09*	−26*	78							
10 Supplier investments × uncertainty	—	—	−07	08	00	−06	05	−05	−16*	02	−15*							
11 Supplier dependence × distributor dependence	—	—	−07	−09	−19*	−10*	00	−04	−10*	−11*	10*	−07						
12 Supplier dependence × uncertainty	—	—	−03	−06	12*	10*	03	00	00	−03	−17	16*	−06					
13 Distributor dependence × uncertainty	—	—	−02	04	10*	13*	01	01	−06	04	−09*	06	−20	11*				
14 Interdependence magnitude × uncertainty	—	—	05	09	−09	−20*	05	07	−08	−05	11*	03	21	−34*	−10*			
15 Industry Dummy 2	—	—	12*	05	05	05	02	20*	13*	06	06	−08	−12*	00	−02	−10*		
16 Industry Dummy 3	—	—	−06	−03	−06	−04	01	−06	00	−03	05	01	08	−09	03	09*	−52*	
17 Exclusive dealing	—	—	05	05	06	03	05	22*	12*	03	06	00	−00	−03	04	05	11*	−14*

*$p < 05$

Notes Alpha values are on the diagonal, alphas are not appropriate for second-order reflective constructs of ESI, ISI, and trust tion, new pricing strategy by the supplier's competition, and service improvements by the supplier's competition (α = 81)

Likewise, we view the sharing of ISI as a higher-order construct composed of two first-order dimensions The operational planning information dimension consists of three items on long-term plans regarding the distributor's inventory levels, pricing strategies, and profit margins (α = 74) The customer planning information dimension consists of three items related to long-term plans regarding the distributor's key market segments, new services, and important customers (α = 75) We used five-point scales ranging from 1 ("never") to 5 ("frequently") to measure these items

Our measures of dependence focus on motivational investment in goals rather than on alternatives In line with Kumar, Scheer, and Steenkamp (1998), the supplier dependence measure consists of three items that assess the importance of the distributor's trade area to the supplier, the distributor's contributions to the supplier's long-term growth, and the distributor's contributions to the supplier's sales and profits (α = 70) Similarly, the distributor dependence measure consists of three items that assess the supplier's contributions to the distributor's sales and profits, as well as overall importance to the distributor (α = 91)

We assessed dependence asymmetry by including both measures in the same model In effect, the supplier (distributor) dependence measure captures the impact of a one-unit increase in supplier (distributor) dependence on information sharing, when distributor (supplier) dependence is held at the mean (Heide 1994, Marsden 1981) Thus, our supplier dependence measure reflects dependence asymmetry in the distributor's favor, while our distributor dependence measure indicates dependence asymmetry in the supplier's favor We derived interdependence magnitude by multiplying these two forms of dependence (Lusch and Brown 1996) High numbers reflect high and symmetric levels of each firm's dependence

In congruence with prior research, we operationalize distributor trust as a higher-order construct with two first-order dimensions Honesty comprises three items drawn from Doney and Cannon's (1997) work that ask about the likelihood the supplier will keep its word and honor its commitments (α = 85) Benevolence consists of three items that ask respondents to rate the degree to which the supplier engages in actions that support the business activities of the distributor (α = 88) (Ganesan 1993)

Our measures of DTSIs and STSIs are based on the work of John and Weitz (1988) and Klein, Frazier, and Roth (1990) The DTSIs measure comprises three items that assess the degree to which the distributor invested in facilities specific to the supplier's products, dedicated employees to the supplier's business, and trained customers to use the supplier's products (α = 80) The STSIs measure comprises three items that assess the degree to which the supplier invested in training distributor personnel, developed programs to enhance the distributor's business, and promoted ties to the distributor to end customers (α = 79)

We derived our measure of distributor product-market familiarity from Celly and Frazier's (1996) work, it consists of three items that assess the degree to which the distributor understands its supplier's customer requirements, is aware of changes in the product market, and grasps the product market relative to distributor competitors The measure demonstrates acceptable internal consistency (α = 70)

In congruence with John and Weitz (1988), we measured environmental uncertainty by asking respondents to evaluate the degree to which the market for the supplier's products is characterized by unpredictability and volatility This measure consists of six items assessed with five-point semantic differential scales, and it displays good internal consistency (α = 78)

Finally, our study includes three control variables A distributor that carries the product lines of competing suppliers may be less inclined to share strategic information Thus, we assessed each distributor's degree of exclusive dealing by asking respondents if they carry other suppliers in this product category (i e , yes or no) In addition, we control for unobserved industry-specific effects in the analysis by including two dummy variables for industry type (i e , industrial supplies and industrial equipment)

Construct Validity

We evaluated our key measures through a series of confirmatory factor analysis (CFA) models estimated with AMOS 7 0 We could not include all our measured items in a single model without violating the five-to-one ratio of sample size to parameter estimates (Bentler and Cho 1998) Thus, we specified three separate CFA models consisting of groups of theoretically similar constructs to provide a stringent test of discriminant validity (e g , Antia and Frazier 2001) Specifically, these three models included (1) ESI and ISI, (2) distributor dependence, supplier dependence, DTSI, STSI, and product-market familiarity, and (3) trust and uncertainty These models have fit indexes at or above recommended standards (Model 1 χ^2 = 239, d f = 72, goodness-of-fit index [GFI] = 93, incremental fit index [IFI] = 93, and root mean square error of approximately [RMSEA] = 07, Model 2 χ^2 = 175, d f = 94, GFI = 96, IFI = 97, and RMSEA = 04, Model 3 χ^2 = 244, d f = 64; GFI = 93, IFI = 94, and RMSEA = 07) For all three higher-order construct, first- and second-order factor loadings are high (ranging from 58 to 92) and statistically significant (t-statistics ranging from 7 4 to 13 1)

Furthermore, each measured item has a significant ($p <$ 01) factor loading on its theorized latent construct with small and positive normalized residuals We also conducted iterative comparative tests of one- versus two-factor solutions on pairs of the first-order constructs and found the two-factor model to be superior to the one-factor alternative across all pairs of constructs (Bagozzi, Yi, and Phillips 1991) The iterative Lagrange-multiplier tests provided evidence of nonsignificant loadings, suggesting strong convergent validity Collectively, these tests provide compelling evidence of the dimensionality and discriminant and convergent validity of our measures

Assessing Potential Common Method Variance Bias

Because we gathered our survey data from a single respondent in each distributor organization at a single point in time, our findings may be biased by common method variance (CMV) However, we believe that CMV bias is unlikely, given that our survey assesses constructs that are, for the most part, concrete and externally verifiable and employs highly experienced respondents (Rindfleisch et al 2008)

To assess this potential risk, we conducted three separate tests of CMV bias First, as Podsakoff and colleagues (2003) recommend, we employed Harmon's one-factor test This entails entering all the items for our latent variables into a single factor using CFA procedures We find that the difference in the chi-square value ($\chi^2 = 109$, d f $= 40$) is not statistically significant Thus, there is no general factor that accounts for the majority of the covariance across our measures, mitigating concerns of potential CMV bias

Second, we employed Lindell and Whitney's (2001) marker variable assessment technique In essence, this approach entails identifying a variable (i e , marker) that is theoretically unrelated to our key constructs, assessing its smallest correlation coefficient with the study's theoretical predictors, partialling out this coefficient from the bivariate correlations, and then comparing these partialled results with the results obtained from the unadjusted correlations among the study's predictors and outcomes We conducted this analysis using suppliers' market positioning (ranging from low-end brands to high-end brands) as our marker variable This marker meets Lindell and Whitney's criterion of being theoretically unrelated to our predictor and outcome variables After controlling for the influence of the marker variable with a partial correlation analysis, we find that the unadjusted correlations maintain their size and pattern of significance

Third, we used a variant of the marker variable technique (Lindell and Whitney 2001) offered by Malhotra, Kim, and Patil (2006) Essentially, this technique assesses potential CMV bias by estimating and accounting for a common method–related correlation The original correlation matrix is then adjusted for this correlation and, using a structural equation model, is compared with the original correlation matrix If this comparison of adjusted versus observed correlations reveals no differences in sign or significance levels, CMV bias is unlikely

We employed this analysis and found that the CMV-adjusted correlation matrix does not differ significantly from the uncorrected correlation matrix Importantly, all correlations that were significant in the uncorrected correlation matrix remain significant in the CMV-adjusted matrix, and the path model yields results that are substantively similar to our proposed model Collectively, the results of these three tests strongly suggest that the likelihood of CMV bias is remote, adding to the growing chorus of voices that argue that the risk of CMV bias in organizational research is considerably lower than commonly believed (e g , Doty and Glick 1998, Malhotra, Kim, and Patil 2006, Rindfleisch et al 2008)

Model Specification and Results

We expected that distributor sharing of ESI and ISI would be positively though not causally related Therefore, we employed seemingly unrelated regression analysis to test our conceptualization We mean-centered all variables involved in computing multiplicative interactions before estimation to improve the interpretability of the results

Our omnibus results indicate that both regression models are statistically significant (ESI $\chi^2 = 96\ 34, p < 001$, ISI $\chi^2 = 93\ 82, p < 001$) The specific parameter estimates for each model appear in Table 2 For the sake of reporting convenience, we indicate each ESI-relevant coefficient with the subscript "E" and each ISI-relevant coefficient with the subscript "I" As Table 2 shows, dependence asymmetry favoring the distributor enhances the sharing of both ESI ($\beta_{1E} = 13, p < 01$) and ISI ($\beta_{1I} = 09, p < 05$) Thus, H_1 is supported However, we fail to find support for H_2 and H_3 Dependence asymmetry favoring the supplier and interdependence magnitude are unrelated to the sharing of either type of strategic information ($\beta_{2E} = 04$, $\beta_{2I} = -06$, $\beta_{3E} = -07$, $\beta_{3I} = -09$, all not significant [n s])

Distributor trust in the supplier is positively and significantly related to the sharing of ISI ($\beta_{4I} = 07, p < 05$), in support of H_4 Furthermore, our results reveal that DTSIs are positively associated with the sharing of both types of strategic information ($\beta_{5E} = 19$, $\beta_{5I} = 12$, both $p < 001$) Likewise, STSIs are positively associated with the sharing of both information types ($\beta_{6E} = 08, p < 01$, $\beta_{6I} = 13, p < 001$) These results support both H_5 and H_6 Likewise, H_7 is supported because product-market familiarity is positively associated with distributor sharing of ESI ($\beta_{7E} = 11, p < 01$) Although our results do not support H_{8a}, because environmental uncertainty is unrelated to ESI sharing ($\beta_{8E} = 06$, n s), they do support H_{8b}, because environmental uncertainty is negatively related to ISI sharing ($\beta_{8I} = -12$, $p < 05$)

The moderator hypotheses also have mixed results Interdependence magnitude does not significantly affect the relationship between environmental uncertainty and the sharing of ESI ($\beta_{11E} = 14$, n s), which fails to support H_{9a} However, interdependence magnitude significantly moderates the relationship between environmental uncertainty and the sharing of ISI ($\beta_{11I} = 30, p < 05$) H_{10} proposes a moderator effect of STSIs on the relationship between environmental uncertainty and the sharing of ISI This moderator effect is significant, as Table 2 shows ($\beta_{12I} = 10, p < 05$)

As Aiken and West (1991) recommend, we conducted simple slope analysis to better understand the nature of our statistically significant interactions The results of this analysis appear in Table 3 The first portion of this table presents the main effect of uncertainty on the sharing of ISI, and the second portion focuses on the moderator effect of interdependence magnitude on the relationship between environmental uncertainty and the sharing of ISI When supplier dependence and distributor dependence are both high, the inverse association between environmental uncertainty and ISI sharing becomes nonsignificant, in support of H_{9b} However, the picture is more complex than expected Specifically, when supplier dependence and distributor

TABLE 2
Seemingly Unrelated Regression Parameter Estimates

Predictor		Sharing of ESI		Sharing of ISI
Intercept	β_{0E}	3 31 (08)***	β_{0I}	3 54 (08)***
Dependence asymmetry favoring the distributor	β_{1E}	13 (04)**	β_{1I}	09 (04)*
Dependence asymmetry favoring the supplier	β_{2E}	04 (06)	β_{2I}	– 06 (06)
Interdependence magnitude	β_{3E}	– 07 (07)	β_{3I}	– 09 (08)
Distributor trust		—	β_{4I}	07 (03)*
Distributor specialized investments	β_{5E}	19 (04)***	β_{5I}	12 (04)***
Supplier specialized investments	β_{6E}	08 (03)**	β_{6I}	13 (04)***
Distributor produc-market familiarity	β_{7E}	11 (05)**		—
Environmental uncertainty	β_{8E}	06 (06)	β_{8I}	– 12 (06)*
Dependence asymmetry favoring the distributor × environmental uncertainty	β_{9E}	– 06 (07)	β_{9I}	– 07 (07)
Dependence asymmetry favoring the supplier × environmental uncertainty	β_{10E}	– 07 (11)	β_{10I}	10 (11)
Interdependence magnitude × environmental uncertainty	β_{11E}	14 (14)	β_{11I}	30 (14)*
Perceived supplier investments × environmental uncertainty		—	β_{12I}	10 (05)*
Control Variables				
Industry 2	β_{13E}	05 (07)	β_{13I}	– 02 (08)
Industry 3	β_{14E}	– 05 (07)	β_{14I}	– 05 (08)
Distributor exclusive dealing	β_{15E}	– 02 (02)	β_{15I}	– 01 (02)
Chi-square statistic (*p*-value)		96 34 (00)		93 82 (00)
Pseudo-R^2		17		15

$^{*}p <$ 05 (one-tailed)
$^{**}p <$ 01 (one-tailed)
$^{***}p <$ 001 (one-tailed)

TABLE 3
Impact of Environmental Uncertainty on Sharing of ISI

Type of Impact	Estimated Impact on ISI (Simple Slope)	SE	t-Value
A First-order ("main") effect of environmental uncertainty	– 12	06	–2 00*
B Moderator effect of interdependence magnitude impact of environmental uncertainty on ISI at various levels of supplier (SDEP) and distributor (DDEP) dependence			
$\text{SDEP}_{\text{High}}$ and $\text{DDEP}_{\text{High}}$	– 05	087	– 57
$\text{SDEP}_{\text{High}}$ and DDEP_{Low}	– 31	068	–4 55***
SDEP_{Low} and $\text{DDEP}_{\text{High}}$	– 18	101	–1 78
SDEP_{Low} and DDEP_{Low}	02	056	36
C Moderator effect of STSIs impact of environmental uncertainty on ISI at various levels of supplier specialized investments			
STSI_{Low}	– 22	07	–3 1**
$\text{STSI}_{\text{High}}$	02	07	33

$^{*}p <$ 05 (one-tailed)
$^{**}p <$ 01 (one-tailed)
$^{***}p <$ 001 (one-tailed)

dependence are both low, the inverse relationship between uncertainty and ISI sharing becomes insignificant In contrast, when dependence asymmetry favors the distributor, the inverse relationship between environmental uncertainty and ISI is strengthened Thus, it appears that symmetry in dependence levels attenuates, if not eliminates, the inverse relationship between uncertainty and ISI sharing, while asymmetry in dependence levels in the distributor's favor enhances this effect

The third portion of Table 3 presents the results of the interaction between uncertainty and ISI sharing at different levels of STSIs At low levels of STSIs, the impact of environmental uncertainty on the sharing of ISI is negative and significant ($b_{\text{STSI LOW}} = -22$, $p <$ 01) However, as STSIs increase, the inverse relationship between uncertainty and ISI becomes statistically nonsignificant ($b_{STSI\ HIGH} = 02$, n s) This pattern of results supports H_{10}

Discussion

Summary

This research examined the influence of various relational, distributor, and environmental characteristics on distributor sharing of two types of strategic information (i e , ESI and ISI) with upstream suppliers We tested our conceptualization with completed surveys from approximately 500 distributors across three industries The results provide considerable support for our conceptualization Specifically, we find that distributors share higher amounts of both ESI and ISI with their suppliers when dependence asymmetry is in their favor and when each firm's transaction-specific investments are high The other significant findings highlight the important theoretical distinctions between ESI and ISI In particular, environmental uncertainty has significant direct and interactive effects only on ISI Likewise, distributor trust facilitates the sharing of ISI, and high distributor product-market familiarity enhances the sharing of ESI

Research Implications

The flow of resources between firms has been of central interest in marketing channels research for much of its history (Coughlan et al 2006, Frazier 1999) Thus far, this literature has emphasized the role of interfirm influence on the transfer of physical resources (i e , products) with channel systems However, for contemporary channel relationships, the flow of information between channel members to enhance organizational capabilities and decision making has taken on increased importance (Dyer and Hatch 2006, Grant 1996) The acquisition of customer, competitor, and channel member information serves as the foundation of a coherent marketing strategy (Day 1994, Jaworski and Kohli 1993) Using exchange theory as our conceptual lens, our study is the first to focus on the factors that drive distributors to share strategic information with their suppliers Thus, the results of our study provide an initial baseline of knowledge about distributor sharing of strategic information that others can build on within the channels and marketing strategy areas of the discipline

This research examines both ESI and ISI We distinguish between these two types of strategic information on two critical dimensions (1) the sensitivity of the information to the distributor organization and (2) the accessibility of the information to the supplier organization By its nature, ISI is sensitive and proprietary (see Sislain and Satir 2000) In addition, ISI originates within the distributor organization, and unless leaks occur, its only source is distributor top management Conversely, ESI is less sensitive and proprietary because it originates outside the distributor organization Furthermore, suppliers can access ESI through means other than the distributor organization (e g , supplier surveys with end customers, industry studies by consulting firms) Although this research suggests that ESI and ISI share some common determinants (i e , interdependence and the DTSI and STSI constructs), other determinants were proposed to vary according to the unique characteristics of ESI and ISI

We hypothesized that perceived benefits would encourage distributors to engage in greater sharing of ESI under conditions of high environmental uncertainty The results failed to provide support for this prediction However, we predicted and found that high environmental uncertainty inhibits the sharing of ISI Under such conditions, distributors appear to lack sufficient safeguards to protect sensitive and proprietary strategic information Because of the unpredictability of exchange relationships, distributor concerns about the risks of organizational plans getting into the wrong hands are likely to be highly salient

At a time when environmental uncertainty appears to be increasing for most firms, the inability of suppliers to attain sufficient ISI is troubling However, this research uncovers two levers that suppliers can employ to reduce the impact of uncertainty on the sharing of ISI (i e , interdependence magnitude and STSIs) First, when supplier dependence and distributor dependence are balanced or symmetric (whether at high or low levels), the inverse association between environmental uncertainty and ISI sharing becomes nonsignificant As Kumar, Scheer, and Steenkamp (1995) note, balanced interdependence facilitates resource exchange by promoting cooperation and discouraging opportunism If balanced interdependence can be crafted, the adverse effects of environmental uncertainty can be attenuated

Second, the inverse association between environmental uncertainty and ISI sharing also disappears in relationships that are characterized by high levels of STSIs These investments represent a credible commitment to the distributor that should reduce the perceived risks of sharing ISI in highly uncertain environments (Anderson and Weitz 1992) Although suppliers typically have more control over their specific investments than over facilitating balanced interdependence levels, scarce resources may limit the number of channel relationships in which sizable STSIs can be made In any case, when suppliers can put sufficient safeguards in place, high levels of environmental uncertainty should not impede distributor sharing of ISI Thus, this research indicates that the risks posed by environmental uncertainty may be less pronounced than commonly believed (e g , Pfeffer and Salancik 1978)

We must stress one caveat This research also reveals that when dependence asymmetry favors the distributor, the inverse relationship between environmental uncertainty and ISI is strengthened This is an intriguing finding Apparently, the tendency to restrict ISI sharing is heightened when distributors face an uncertain environment and possess a power advantage Although the distributor is in the driver's seat in such exchange relationships, unbalanced dependence levels may create instability and a greater chance of relationship dissolution in highly uncertain environments (Kumar, Scheer, and Steenkamp 1995, Pfeffer and Salancik 1978) In such cases, suppliers may simply need to accept that they will receive less ISI from distributors than what they desire and adapt their decision-making processes accordingly

Two additional findings support the importance of the theoretical distinctions between ISI and ESI First, the results indicate that distributor trust in the supplier promotes the sharing of ISI When a supplier is considered honest and benevolent, the distributor is likely to be reassured that its channel partner will not misuse shared ISI against distributor self-interests (Frenzen and Nakamoto 1993, Morgan and Hunt 1994) We did not expect distributor trust to affect the sharing of ESI given that it is less sensitive and more accessible than ISI Second, the results reveal that distributor product-market familiarity facilitates the sharing of ESI Not only do distributors possess a large amount of ESI when product-market familiarity is high, but they also need to exert minimal cognitive effort to share such information because of its degree of depth and accessibility (Alba and Hutchinson 1987) The costs of sharing ESI appear low in such cases We did not expect familiarity with the external environment to affect the sharing of internal plans in any way

These findings highlight the importance of considering the inherent differences between ESI and ISI The major research implication is that for different types of information that are shared between channel members, care must be taken when trying to understand the theoretical distinctions among them The antecedents and consequences of different types of information are likely to vary

Finally, note that though our empirical analyses cannot prove causality, the opposite direction of causality in our study is much less likely Our exchange theory–oriented conceptualization and our prestudy interviews support the interpretation of the empirical results we present As Rindfleisch and colleagues (2008) recently argued, the establishment of causal inferences is largely dependent on theory rather than data

Managerial Implications

This research offers three key managerial implications for suppliers trying to obtain strategic information from their distributors First, both our theory and our findings indicate that suppliers can gain more strategic information from distributors if they can enhance the benefits and reduce the costs and risks that distributors perceive when engaging in this behavior Our findings suggest that this perception management can be achieved through a variety of mechanisms, including ceding a power advantage to the distributor, undertaking investments specific to the distributor organization, encouraging DTSI, and gaining the distributor's trust Thus, suppliers have a wide variety of strategic tools they can employ to gain access to valuable strategic information Suppliers must recognize that in some channel relationships, attempts to gain significant amounts of strategic information are likely to fail Therefore, a segmentation approach to acquiring strategic information is necessary, such that suppliers seek to gain EIS and ISI primarily in relationships in which the utilization of strategic tools is effective

Second, suppliers need to keep careful track of how much and what type of strategic information they receive from each distributor Without such an understanding, supplier management will have little guidance in determining what types of strategic information they need to obtain from other sources and at what cost The acquisition of strategic information is highly important to the supplier organization, and an understanding of what is received from downstream distributors is a necessary component in this process (e g , Day 1994)

Third, our findings suggest that suppliers with a power advantage in their channel relationships face an important dilemma Although the extant channels literature broadly suggests that powerful suppliers can gain distributor compliance (Frazier 1983b, Gaski and Nevin 1985), our research suggests that a supplier power advantage does little to enhance the amount of strategic information gained from distributors Strategic information appears to be a resource that cannot be easily squeezed from downstream channel members through the use of pressure, because verifying the strategic information a distributor actually possesses is extremely difficult Powerful suppliers may be able to partially mitigate this problem by making heavy STSIs in their channel relationships and taking actions to enhance distributor trust in their organizations

For distributors, our study identifies the conditions under which distributors share ESI and ISI with their suppliers If a distributor organization finds that its sharing of strategic information varies significantly from our findings, it should reexamine the benefits, costs, and risks of this behavior The sharing of strategic information with suppliers can provide major benefits to a distributor if costs are controlled and necessary risk-reduction safeguards are in place

Future Research Directions

As an initial study in a new domain, our investigation represents a preliminary inquiry Further research can extend and enrich our contributions Thus, we briefly identify promising directions for the future First, research could provide an important contribution by examining a broader array of types of information Our inquiry examines two types of strategic information according to their degree of sensitivity and accessibility (Ghosal and Kim 1986) However, other types of strategic information likely exist, based on such dimensions as the degree of novelty (e g , exploitive versus explorative) and the degree of codification (e g , tacit versus explicit) Furthermore, the entire realm of tactical information remains untouched Investigations into additional types of information that distributors share with upstream suppliers would complement our research

Second, this research focused exclusively on information sharing through traditional communication modes (i e , telephone and face-to-face communication) However, strategic information is increasingly transmitted through electronic modes, such as e-mail and video conferencing (Ganesan, Malter, and Rindfleisch 2005) Thus, future investigations could enhance our research by examining the degree to which distributors and other types of channel members are willing to transfer strategic information through both conventional and emerging modalities Firms may be reluctant to share sensitive and proprietary information through e-mail because of concerns about privacy and security (Vogelsang and Compaine 2000) Thus, communication modality may play an important role in determining the degree to which suppliers are able to obtain strategic information from their distributors This role is in need of considerable elucidation in further research on information sharing activity among channel members

Third, we presumed that the predictor variables in our conceptual framework would drive the distributor's sharing of strategic information rather than vice versa Given the cross-sectional nature of our data, we are unable to test this causal assumption Further research (e g , field experiments) aimed at examining the causal relationships between relational, environmental, and firm-based characteristics and the sharing of strategic information could be beneficial in examining the soundness of our conceptualization

Finally, our conceptual framework largely focuses on constructs associated with the nature of the exchange relationship between distributors and suppliers We examine only one distributor characteristic (i e , product-market familiarity) and one environmental characteristic (i e , environmental uncertainty) Thus, further research that examines how the sharing of strategic information is influenced by a broader array of distributor characteristics (e g , complexity of the distributor organization, the distributor's competitive position), environmental characteristics (e g , end-customer heterogeneity, supplier and distributor concentration), and supplier characteristics (e g , desire to acquire strategic information) would be especially valuable

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Michael A. Wiles & Anna Danielova

The Worth of Product Placement in Successful Films: An Event Study Analysis

As a result of the diminishing effectiveness of broadcast advertising, firms are increasingly turning to product placements in films and television to promote their products A growing stream of product placement research has conducted surveys of consumer and practitioner views on the practice and experiments to gauge product placement's impact on brand awareness, attitudes, and purchase intent However, there is no evidence of whether firms' investments in film product placements are worthwhile The event study of 126 product placements in successful films during 2002 reveals a mean cumulative abnormal return of 89% during the film's opening, indicating that product placement in a successful film is associated with positive movements in firm stock prices Cross-sectional analysis of the returns offers new insight into how product, film, and execution factors influence the placement's worth The authors find that placement abnormal returns are enhanced by tie-in advertising and brand equity but are inhibited by audience absorption, critical acclaim, and violent film content Placement modality, character associations, and blatancy also significantly affect the placement's value

Keywords product placement, brand integration, event study, movies, abnormal returns

The shareholder returns to marketing actions and resource deployments are a primary concern of scholars and firms (Rust et al 2004) As one of the most visible areas of marketing activity and the largest item of marketing spending in most firms, advertising has been an area of particular interest to researchers and managers Several empirical studies of the advertising–performance relationship have provided strong evidence that firms' traditional advertising communications generate positive wealth for shareholders (Conchar, Crask, and Zinkhan 2005) However, because of growing consumer resistance to traditional broadcast advertising, firms are increasingly turning to alternative ways to reach consumers and enhance the value of their brands (Elliot 2008, Keller 2001) An alternative that has received particular interest among many firms is product placement in television and films

Product placement (also sometimes referred to as "brand integration") is the inclusion of branded products or identifiers through audio or visual means within mass-media programming (Balasubramanian 1994) Film product placement originated in the 1940s, but only in the past decade have firms employed it as a key marketing tactic (Karrh, McKee, and Pardun 2003) Firms paid $722 million in fees, free products, and promotional support for film product placement in 2005, and by 2010, spending on film placement is predicted to surge to $1 8 billion (PQ Media 2006) In general, fees for individual placements are not disclosed, but firms are known to have contributed $25 million toward the production cost of *Minority Report* to showcase their products and services (Grossberg 2002) Cadbury Schweppes and Mitsubishi have each spent tens of millions of dollars promoting film placements, and Volkswagen will spend $200 million on fees and promotion to be integrated into NBC Universal's films and television programs (Finnigan 2002, Ives 2005, Linnet and Halliday 2003)

However, in contrast to traditional broadcast advertising activities, the literature reveals little evidence on whether these investments pay off (Balasubramanian, Karrh, and Patwardhan 2006), and firms are either unable or unwilling to make such assessments (Russell and Belch 2005) Given the increasing pressures to hold marketing expenditures accountable (Day and Fahey 1988, Luo and Donthu 2006, Rust et al 2004) and managers' evident uncertainty about the legitimacy and role of film product placement in their marketing strategies, objective assessments that calibrate the contribution of film placement to firms' expected cash flows and profits are urgently needed To address this important knowledge gap, this article addresses the fundamental question of the economic worth of placement in films

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We investigate the worth of product placements in films through an event study Event studies are commonly used to assess the returns to a marketing action because it is extremely difficult to control for all the other concomitant factors that influence firm revenue and profits (Geyskens, Gielens, and Dekimpe 2002) Event studies allow the event's unique contribution to the firm's future profit performance to be isolated and measured (Hyman and Mathur 2005) Examining the highest-grossing movies in 2002, we show that product placements in successful films are associated with abnormal returns for shareholders This provides the first empirical evidence to support the value of film product placement In addition, we advance theoretical understanding by constructing a comprehensive model of the product and program factors that affect film placement worth, and we test this model using a cross-sectional analysis of the abnormal returns This provides important new insights into which placement strategies maximize shareholder value

We organize the remainder of the article as follows After reviewing the gaps that hinder our understanding of the returns to product placements in successful films, we integrate theory on the marketing–finance interface with insights from the advertising response and media effects literature streams to develop hypotheses on how product and film factors affect placement worth We then review our data collection, and after presenting the results of the event study and the cross-sectional analysis, we discuss our findings Finally, we discuss the theoretical and managerial implications of the study

Literature Review

Considerable research indicates that firms' advertising and marketing communication decisions have strong influences on firms' stock prices One perspective holds that advertising indicates the availability of discretionary firm resources and firm financial solvency (Erickson and Jacobson 1992), but spending on advertising is more commonly viewed as an investment in intangible firm assets, shaping the prospective size and vulnerability of the firm's future cash flows (Srivastava, Shervani, and Fahey 1998) Advertising is also believed to raise the firm's capital market visibility, which can broaden the firm's investor base, improve liquidity, and lower the firm's systematic risk and cost of capital (Grullon, Kanatas, and Weston 2004, McAlister, Srinivasan, and Kim 2007) Studies of firms' aggregate advertising expenditures have found that increased levels of advertising and related brand-building activities are associated with enhanced cash flows and market values (Conchar, Crask, and Zinkhan 2005) However, the returns to individual ad campaigns are more variable (Agrawal and Kamakura 1995, Tellis et al 2005, Wiles 2007)

Evidence that alternative ways of enhancing product exposure are worthwhile is still emerging The results from event studies suggest that major-league sports and Olympic sponsorships enhance firms' stock prices (e g , Cornwell, Pruitt, and Clark 2005), but the wisdom of less salient communication alternatives, such as product placement, remains unclear Investors' judgments of the worth of a firm's marketing action are conditioned by the action's perceived consumer impact (Lane and Jacobson 1995) Therefore, the economic return to product placement in successful films is inextricably connected to the placement's expected effects on consumers

Scholars have primarily pointed to McCracken's (1989) meaning-transfer model as a mechanism that can explain consumers' response to placements McCracken suggests that the use of celebrity endorsers is effective because celebrities are endowed with symbolic meaning that is passed on to the product through its association with the celebrity In much the same way, popular entertainment has rich symbolic meaning that can be transferred to the placed product (Russell 2002) Consumers connect the film world to their own, mapping their aspirations onto the products placed in the film (DeLorme and Reid 1999), which in turn influences attitudes and consumption norms (Pechmann and Shih 1999). For these reasons, film and television product placements have been found to enhance brand awareness, attitudes, and purchase intent (e g , D'Astous and Chartier 2000, Russell 2002) Prominent placements capture attention and enhance these intermediate consumer outcomes (e g , Gupta and Lord 1998), but the enhancing effects of other execution factors, such as modality and plot connection, have received less consistent support (Law and Braun 2000, Russell 2002), clouding knowledge of which placements are valuable

Therefore, our review suggests that several gaps remain in the understanding of film product placement Because there is no direct evidence connecting film placement to increases in firm cash flows and stock price performance, it remains unclear whether film placement is indeed a wise practice Prior placement research has also paid little attention to how film characteristics affect placement outcomes This oversight is surprising, given the substantial literature on how program factors affect ad effectiveness (Feltham and Arnold 1994) Because it is also not apparent how product-level factors affect placement value and because prior research has not simultaneously controlled for each of the different execution dimensions, firms have little knowledge about which placement opportunities to pursue Thus, there is a need for research that can discern the worth of film placement and that considers simultaneously the effects of product, film, and execution factors Our event study approach is uniquely suited to filling this gap

Conceptual Framework

Film placement worth is derived from the placement's ability to influence shareholder value positively, and there are several hypotheses that can offer a credible mechanism by which product placement information affects investor decisions First, the price pressure hypothesis states that public attention (Barber and Odean 2008, Meschke 2004) or public mood and enthusiasm (Fehle, Tsyplakov, and Zdorovtsov 2005, Huberman and Regev 2001) alone can move stock trading volume and prices Second, the investor recognition hypothesis, originally developed by Merton (1987), highlights the role of increased publicity and firm awareness on investor trading behavior According to this view, increased visibility for a firm can draw investor attention, induce some of these investors to follow the firm, and motivate these investors to become new shareholders, thus leading to a greater ownership base of the stock and greater liquidity (Grullon, Kanatas, and Weston 2004) Similarly, scholars have found that increased publicity for initial public offerings attracts additional retail investors to such offerings and enhances offer price valuations (Cook, Kieschnick, and Van Vess 2007) Third, the investor sentiment hypothesis posits that sentimental investors may drive up the relative demand for shares of the firms that have the vector of principal characteristics that is compatible with their sentiment (Baker and Wurgler 2006)

Perhaps more important, however, film placement information can also be expected to affect stock prices by directly changing investor expectations regarding the firm's future financial performance, and thus there would also likely be information-based trading in response to the film placement event Because the firm's stock price reflects the discounted value of the firm's expected cash flows, marketing activities that accelerate and enhance future cash flows have the ability to affect shareholder value positively (i e , the stock price effect) (Anderson, Fornell, and Mazvancheryl 2004, Gruca and Rego 2005, Rao and Bharadwaj 2008) Financial markets are forward looking, thus, if the film placement has positive implications for the firm's prospects, the firm's market value will shift to reflect these anticipated changes in the firm's financial performance before these changes actually occur By building intangible market-based assets, firm marketing actions have the potential to shape prospective cash flows and, thus, the firm's market value by (1) increasing cash flow levels, (2) accelerating cash flow timing, (3) reducing cash flow vulnerability, and (4) increasing the firm's residual value (Fornell et al 2006, Srivastava, Shervani, and Fahey 1998) Evidence suggests that film product placement can facilitate firm performance in each of these ways

How Film Product Placement Positively Shapes Expected Future Cash Flows

First, there are strong reasons for investors to expect that film product placement enhances future cash flow levels Ample evidence indicates that product placements increase consumer awareness and enhance brand attitudes (e g , D'Astous and Chartier 2000, Gupta and Lord 1998) Thus, film product placement has the potential to improve brand equity, and improvements in brand equity have long been associated with increased consumer demand and increases in cash flow levels (Aaker and Day 1974, Conchar, Crask, and Zinkhan 2005) Enhanced brand associations can also increase the perceived value of the firm's offering and improve customer satisfaction, further facilitating cash flows (e g , Gruca and Rego 2005, Rust, Zahorik, and Keiningham 1995) For these reasons, strong links between brand enhancement and improvements in firm market value have often been observed (Aaker and Jacobson 2001, Lane and Jacobson 1995)

Second, film placements can enhance firm market values by accelerating the expected timing of the firm's cash flows Placements have been found to increase purchase intent (Gould, Gupta, and Grabner-Krauter 2000), thus, placements can lead to impulse purchases, which can accelerate the receipt of cash flows A placement's ability to stimulate new product uses and applications may also further facilitate investors' expectations of firm cash flow timing Placements are especially effective in encouraging new types of product consumption because placements are aspirational and can set consumption norms (Russell 1998)

Third, film product placement has the potential to enhance firm market value by reducing the expected vulnerability of the firm's cash flows Consumers' connections with films can create strong loyalty for the products in the film, creating substantial switching costs Placements can also affect consumption trends and styles for years after the film's release (Yorks 1989) Ford's use of Steve McQueen in a 2005 Mustang commercial further suggests that film placements can be an enduring source of positive brand associations and equity

Finally, film product placement can be expected to expand the firm's customer base, increasing the firm's residual value The significant increase in sales of Red Stripe after *The Firm* and the Mini Cooper after *The Italian Job* is testament to the potential of film placement to attract new customers to brands Moreover, film placements are an attractive way to target specific audiences, such as teenagers, and they allow firms to expose their products to consumers who would not normally pay attention to the brand For example, Cadillac placed its cars in *The Matrix Reloaded* to reach a younger audience

In summary, extensive theory and evidence suggest that investors should react positively to film placement Placements should lead investors to develop positive expectations for future financial performance because placements can lead to improvements in brand associations and loyalty that can accelerate and enhance the firm's cash flows For these reasons, we posit the following

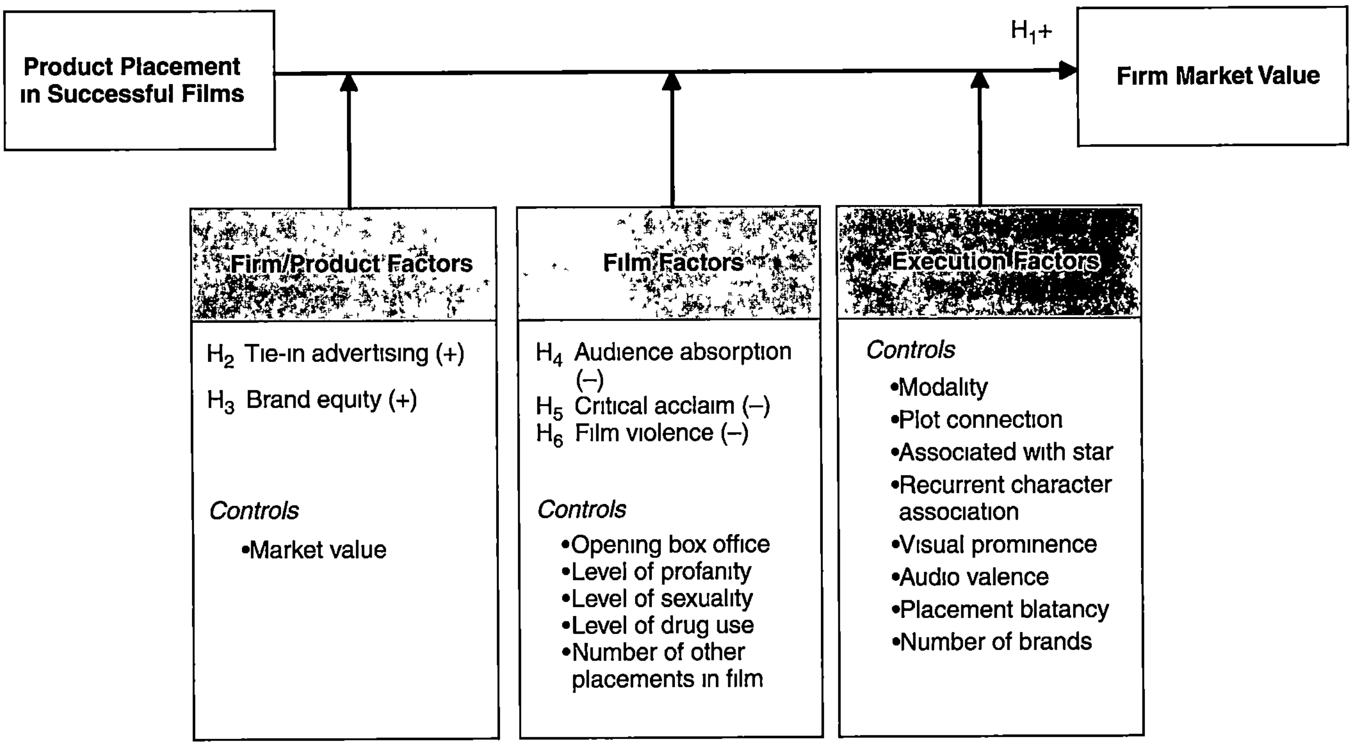
> H_1 Film product placement is positively associated with a change in firm market value

Following advertising response models (MacInnis and Jaworski 1989), we assert that the worth of a film product placement is related to product, film, and execution factors (see Figure 1), which affect the likely consumer and investor response to the placement Because of the ample research on the execution factors, we incorporate these factors into our framework as controls

Product and Film Determinants of Placement Worth

Tie-in advertising Tie-in advertising occurs when the firm promotes a product's appearance in a film before the film's release First, a reason cash flow levels due to the placement are enhanced is that tie-in advertisements facilitate consumer processing of the placement Prior exposure to a concept increases the concept's accessibility (i e , Higgins and King 1981), improving people's ability to identify the concept in visually complex environments Therefore, tie-in advertisements increase the likelihood that consumers will notice the placement in the film

FIGURE 1
A Conceptual Model for the Worth of Product Placements in Successful Films



Second, placements supported by tie-in advertising campaigns are worth more because the tie-in campaign strengthens consumers' meaning transfer from the film to the product. Consumers are more likely to draw film–product connections because the advertising and its cost highlight the placement's significance to the firm. The expense and publicity of the tie-in campaign increase the placement's diagnosticity (Kirmani 1990), elevating the importance of the placement in consumers' network of brand associations. Tie-in advertising may also create contextual priming effects (Yi 1993), which further facilitate meaning transfer.

Third, the expenditure of financial and organizational resources on the tie-in advertising also signals the placement's strategic importance to the firm. The tie-in campaign indicates the priority that the firm places on leveraging its involvement with the film, suggesting that the firm considers the film's associations vital additions to the brand. Investors may also respond more favorably because of the potential communication synergies of the tie-in campaign.

In summary, tie-in advertising directs consumer attention to the placement and thus enhances film–product meaning transfer and bolsters film–product connections. For these reasons, we expect the following:

H_2: The worth of product placement in successful films is positively related to the presence of tie-in advertising.

Brand equity. Familiar, favorably regarded brands have high brand equity (Keller 1993), and the returns from film product placement should be positively related to brand equity for three primary reasons. First, consumers' motivation and ability to process the placement increase when the placement is for a strong, familiar brand rather than a weak, unfamiliar brand. Attention in cluttered visual environments focuses on objects with easily accessible attitudes, and consumers are more motivated to pay attention to advertisements for well-known brands (Tellis 1988). As a result, advertisements for well-known brands enjoy higher levels of recall, and well-known brands are less affected by competitive inference (Kent and Allen 1994). Thus, placements for high-equity brands are worth more because these brands draw attention, lengthening the opportunity for meaning transfer.

Second, evidence also indicates that brand equity may enhance the mapping process. Because of consistency concerns, positive information is weighed more heavily when the brand is familiar and well regarded (Ahluwalia 2002). Thus, the mapping of the film onto the product occurs more easily for high-equity brands, enhancing the increases in demand and cash flows from the placement.

Third, placements for high-equity brands may convey more strategic information to financial markets. The high-equity brand's high familiarity suggests that the primary intent of the placement is not merely to increase brand exposure but also to deepen and enhance brand associations. Therefore, investors are likely to infer greater strategic significance to these brand placements. For example, the placement of Mercedes in *Men in Black II* signified new emphasis on the fun of driving a Mercedes, a shift to enhance the brand's appeal with younger consumers. Thus, brand equity expands the returns from film placement because it leads to favorable consumer processing and to positive inferences about the brand's future strategic direction

H$_3$ The worth of product placement in successful films is positively related to brand equity

Audience absorption Theories from multiple research streams suggest that the level of audience absorption affects consumers' motivation and ability to attend to placements Media processing models from psychology contend that people process the narratives in books and films by becoming absorbed in and transported into the story (Dal Cin, Zanna, and Fong 2004) Absorption is a convergent process in which attention is focused on understanding the events in the narrative, leaving little motivation and ability for other tasks People who are absorbed lose themselves in the story, thus limiting placement awareness

The relationship between advertising effectiveness and program involvement suggests additional evidence for the inhibiting effect of absorption Most of this research has examined the effects of program involvement in situations, such as radio and television commercials, in which the program and the advertisement are presented sequentially (Lord and Burnkrant 1993) With placements, however, the entertainment and commercial messages are presented concurrently When the advertisement is presented at the same time as the entertaining content, program involvement inhibits attention to the advertisements (Norris and Colman 1992, Wang and Calder 2006), thus limiting the opportunity for meaning transfer

In summary, these streams converge on the idea that placements in absorbing films receive less favorable consumer processing Therefore, investors should react less positively to placements in absorbing films

H$_4$ The worth of product placement in successful films is negatively related to film absorption

Critical acclaim Though counterintuitive, three arguments suggest that placements in critically acclaimed films are less valuable to the firm First, evidence suggests that consumers become irritated when advertisements impede consumption goals (Edwards, Li, and Lee 2002) Product placements in critically acclaimed films hinder consumers' attainment of their artistic consumption goals (Holbrook and Hirschman 1982) because the placements are commercial messages that disrupt their experience of the film Thus, consumers become upset and angry when they encounter placements in critically praised films (DeLorme and Reid 1999), which dampens brand evaluations

Second, because consumers expect the high art experience to be free from advertising persuasion tactics (Charters 2006), the appearance of placements in acclaimed films may also disconfirm expectations Disconfirmation leads to increased elaboration and lower evaluations of the discrepant product when the novelty is not appreciated (Campbell and Goodstein 2001) These negative reactions to the placement may be exacerbated if the artistic processing goals increase the irrelevance of the discrepancy, further lowering the placement's worth

Third, there is growing consumer consciousness that certain public artistic goods need to be protected from advertising messages (Klein 1999, Meenaghan and Shipley 1999) Thus, consumers may react negatively to placements in acclaimed films because they believe that these films should be a protected area, free from marketing persuasion tactics As such, consumers may perceive placements in acclaimed films as inappropriate, thus reducing their worth

In summary, research streams on goal impediment, information expectancy, and marketing tactic appropriateness converge on the idea that consumers react less positively to placements in critically acclaimed films Because consumer anger and annoyance with an advertising tactic are believed to reduce advertising effectiveness (Aaker and Bruzzone 1985), we predict that investors consider placements in critically acclaimed films less valuable

H$_5$ The worth of product placement in successful films is negatively related to film critical acclaim

Association with violence There are two main reasons to suspect that violence in films diminishes placement worth First, the literature on media violence contends that consumers react to violence in television and films with feelings of hostility, aggression, and anger (Bushman 2005) These negative emotions and associations may be transferred to the placed product (McCracken 1989), thus attenuating placement value For example, recent studies have found that advertisements embedded in violent television programs generate lower purchase intentions (Bushman 2005)

The second reason film violence may diminish placement worth is related to the inferences consumers draw from the firm's involvement with the violent film A product placement functions as an endorsement (Russell 1998), so a placement suggests that the firm approves of the film's subject matter If the firm disapproved of the film's content, it would not have placed the product in the film For example, airlines refuse placements in films that depict flying in a negative manner A product placement sends the message that the firm is not bothered by the film's violence, and thus consumers may lower their opinions of products placed in violent films because of their concerns about film violence and its negative impact on society (Brown and Dacin 1997, Salwen and Dupagne 1999)

In summary, we hypothesize that placement worth is negatively related to the level of violence in films However, young men are less bothered by media violence (Hamilton 1998) This suggests that products that are primarily targeted toward consumer segments that do not judge film violence negatively are less harmed by violent content Although we make no formal prediction, we examine whether product type moderates the impact of violence

H$_6$ The worth of product placement in successful films is negatively related to film violence

Method

Event Study Methodology

We use the event study methodology to assess the impact of the event's unexpected information on the firm's stock price The efficient market hypothesis asserts that a stock price reflects all public information about the firm, so only unexpected information can change the price of a stock (Fama et al 1969) If the new information indicates that the firm will garner higher (lower) future cash flows, the firm's stock price rises (drops) in reaction to the new information The stock's abnormal return—the difference between the expected returns based on general market movement and the actual returns—provides an unbiased estimate of the economic worth of the event (Brown and Warner 1980) Excellent reviews of the market model approach for estimating abnormal returns have appeared recently in the literature (e g , Srinivasan and Bharadwaj 2004) We use the portfolio method to construct our test statistic due to our event date clustering (Jaffe 1974), and we present details about this test in the Appendix

Information about the company's film placement is disseminated to the market when the film is released, as well as before the event, through firm promotional efforts This firm publicity can cue investors to the placement—drawing attention to the film—but we assume that the information needed to change investors' beliefs about the firm's prospects is not available to investors until the film is shown. We validate this assumption in our results

Data

Because Hollywood studios release approximately 200 films each year, we limited our analysis to the most popular films, or the 31 movies in 2002 that made $20 million in the United States during their first weekend, according to Boxofficemojo com Seven movies had no product placements, so our final sample included 24 films

Variable Operationalization

Our event is the appearance of a product in the released film and the circumstances of its appearance because information about how the product appears (placement execution) and the film context in which it appears (e g , film violence, audience size) is not available until the film's release A visual placement occurs if the product's name or logo is legibly shown on the screen, and an audio placement occurs if the product is mentioned (Russell 2002) We summarize our measurement of the product, film, and execution factors in Table 1, and we present descriptive statistics and correlations in Tables 2 and 3

Firm/product factors We operationalized tie-in advertising as whether the firm supported its placement with a promotional advertising campaign, which we identified through a Factiva search We measured brand equity as the brand's value in billions of dollars from *BusinessWeek*'s top 100 global brands in 2002, a valid measure of brand equity (Madden, Fehle, and Fornier 2006) We also controlled for the market value of the firm on the event day, which we determined by multiplying the closing stock price on the event day by the number of shares outstanding

Film factors To proxy audience absorption, we used the decimal equivalent of the film's grade from CinemaScore, a market research firm that surveys opening-night audiences about how much they enjoyed the film Enjoyment is a good proxy for absorption for two reasons First, theorists assert that one key element of an enjoyable book, or film, is that it is absorbing, it transports people from their mundane reality into a story world (Green, Brock, and Kaufman 2004) Second, it has been empirically determined that enjoyment is highly correlated with absorption levels ($\rho = 77$) (Green et al 2004).

We measured critical acclaim as the film's METASCORE, which we obtained from Metacritic com, a Web site that aggregates the ratings of approximately 40 film critics Using this score, we developed an index (0–100) of critical sentiment toward the film We determined the film's level of violence, profanity, and sexuality using data from Kids-In-Mind, one of the oldest and most popular film content advisory services Kids-In-Mind employs trained reviewers who screen for objectionable material and then rate the film's amount of violence, profanity, and sexuality on a scale ranging from 0 to 10 The organization has no political or religious affiliation, it aims to provide an "objective" account of the level of violence, sex, and profanity in the film, without making value judgments about the age appropriateness of the content (Thompson and Yokota 2004). Kids-In-Mind does not provide a rating for drug content, so we had two independent coders review the films and record the instances of drug use We included the film's opening three-day gross in the model to control for the placement's potential reach We also included the number of placements in the film for other firms to control for competitive interference from other placements

Execution factors To account for the idiosyncrasies in placement execution, we captured measures for all execution factors previously found to affect consumers' placement processing The placement's "plot connection" reflected whether the placement advanced the plot or increased the audience's understanding of a main character (Russell 2002) To control for placement "modality," we captured the number of audiovisual placements for the firm in the film We incorporated the "prominence of the visual placement" by capturing the placement's time on screen, the time in the background, and the time that the product was the only placement on screen (Gupta and Lord 1998) We captured the "valence of the audio placement" to control for differences in endorsement (Russell and Stern 2006) An audio mention was positive (negative) if it was a favorable (critical) comment about the product Comments that were neither positive nor negative were considered neutral However, perfect multicollinearity with plot connection prevented positive valence from being included in the analysis Because of their high correlation with plot connection, we did not include time in background and neutral valence to minimize the potential problems of multicollinearity

We controlled for "star association" because celebrities increase attention, recall, and purchase intent (Agrawal and Kamakura 1995) Actors credited before the film's title were considered stars (Lippman 2005), and star association was recorded as a binary variable, representing whether the product was touched, held, consumed, or mentioned by the star We also controlled for "association with a recurrent character," a character established in a previous film or tele-

TABLE 1
Variable Operationalization

Firm/product factors	Tie-in advertising	A binary variable representing whether the firm ran a tie-in promotional campaign in conjunction with the film, as identified by a Factiva search
	Brand equity	The brand's value according to the 2002 *BusinessWeek* list of the top 100 global brands (in billions)
	Market value	The closing market price times the number of shares outstanding from the Center for Research in Security Prices
Film factors	Audience absorption	Average CinemaScore grade from opening-night audiences converted to its decimal equivalent (e.g., A = 4.00)
	Critical acclaim	The METASCORE index from Metacritic.com, which represents the weighted average grade of approximately 40 film critics, converted to a 0–100 scale
	Level of violence	The violence/gore rating for the film (0–10) from Kids-In-Mind, an independent, objective film advisory service
	Level of profanity	The profanity rating for the film (0–10) from Kids-In-Mind
	Level of sexuality	The sex/nudity rating for the film (0–10) from Kids-In-Mind
	Level of drug use	The number of instances of drug use in the film, as identified by independent coders
	Opening box office (audience size)	The opening three-day box office revenue in tens of millions of dollars from Boxofficemojo.com. For most films, this was the Friday–Sunday gross. For two films, this was the Wednesday–Friday gross
	Number of other placements in film	The number of placements for other firms' products in the film
Execution factors	Modality: number of audiovisual placements	The number of times the product's appearance on screen is paired with a verbal mention
	Visual: low plot connection	The time the product appears on screen unconnected to the plot (in seconds)
	Visual: high plot connection	The time the product appears on screen connected to the plot (in seconds)
	Visual: no other products visible	The percentage of time the product appears on screen by itself
	Audio: low plot connection	Product mentions that do not advance the plot or provide meaningful information about the character (number of mentions)
	Audio: high plot connection	Product mentions that advance the plot or provide meaningful information about the character (number of mentions)
	Audio: negative valence	The number of times the product is referred to unfavorably
	Star association	If the product is used or mentioned by an actor with above-the-title credits
	Recurrent character association	If the product is used or mentioned by an established screen character. Ten films contained established screen characters (*Blade II*, *Die Another Day*, *Austin Powers in Goldmember*, *Jackass: The Movie*, *Men in Black II*, *Red Dragon*, *The Santa Clause 2*, *Scooby-Doo*, *Spider-Man*, and *The Sum of All Fears*)
	A blatant placement	If multiple film critics' reviews complained about shamelessness or the excessiveness of the placement. These film reviews were published only on the –1 and 0 trading days
	Number of brands	The number of the firm's brands appearing in the film

TABLE 2
Descriptive Statistics

	Minimum	Maximum	M	SD
[–2, 0] abnormal return in percent	–4 75	13 95	89	2 83
Product Factors				
Tie-in advertising	00	1 00	09	28
Brand equity	00	69 64	6 58	15 46
Market value	01	374 32	30 12	52 95
Film Factors				
Audience absorption	2 33	4 00	3 51	28
Critical acclaim	24 00	80 00	55 91	16 61
Level of violence	2 00	10 00	5 06	1 66
Level of profanity	2 00	10 00	5 12	2 12
Level of sexuality	1 00	7 00	3 43	1 48
Level of drug use	00	8 00	28	1 14
Opening box office (in tens of millions of dollars)	2 02	11 48	4 48	2 55
Number of other placements in film	00	32 00	14 77	8 90
Execution Factors				
Modality				
Number of audiovisual placements	00	1 00	08	27
Visual Placement Execution				
Low plot connection (time)	00	60 00	5 98	9 92
High plot connection (time)	00	133 00	5 06	19 32
No other products visible (%)	00	1 00	56	49
Audio Placement Execution				
Low plot connection (number)	00	4 00	34	63
High plot connection (number)	00	4 00	14	53
Negative valence (number)	00	2 00	02	20
Other Execution Factors				
Star association	00	1 00	39	49
Recurrent character	00	1 00	16	37
Commercially intrusive	00	1 00	05	21
Number of brands	1 00	4 00	1 16	51

vision show (e g , Austin Powers, Scooby-Doo), because consumers have richer associations for known screen characters than for newer characters A placement was considered "blatant" if two or more film critics' reviews (from those accessible through Factiva) complained about the shamelessness or the excessiveness of the placement, and placement blatancy was recorded as a binary variable Finally, we controlled for the number of brands because a firm is likely to obtain greater returns if more of its products are connected to the film

Data Collection Procedure

To identify the placements and how they appeared in the film, an author and a graduate student independently watched DVDs of the films and recorded the features of the placement's execution These two coders recorded the placement's modality, plot connection, visual prominence, and valence Only placements for products for firms traded on the major U S stock exchanges were recorded The appearance of a product during a scene was considered a placement If a product appeared multiple times in one scene, this was recorded as a single placement, but placements in multiple scenes were recorded separately

The coders identified 283 visual and audio placements of products of companies publicly listed in the United States, with an interrater reliability index of 79 (Perreault and Leigh 1989) Interrater reliabilities for the placement's modality, plot connection, prominence, and valence variables were all greater than 80, and all discrepant codings were resolved through discussion These 283 placements represented 177 events because some firms had multiple placements in a film We used aggregated totals of a firm's placements in a film in the cross-sectional analysis

To measure the placement's blatancy, we conducted a Factiva database search to identify whether a film critic mentioned the product in the review Two independent student coders then read the 163 film reviews that mentioned a product and recorded whether the critic complained about the shamelessness or the excessiveness of the placement Interrater reliability (see Perreault and Leigh 1989) was high (95), and the coders independently resolved their discrepant coding Independent coder ratings of film drug use also displayed high interrater reliability (87)

Analysis, Results, and Discussion

Event Analysis

The event date was the day the film opened in theaters Following McWilliams and Siegal's (1997) recommendations, we used a Factiva database search to remove firms with

TABLE 3
Correlations

Placement worth	[–, 0] abnormal return	1 00																						
Product/firm factors	Tie-in advertising	30	1 00																					
	Brand equity	10	−02	1 00																				
	Market value	02	01	37	1 00																			
Film factors	Audience absorption	−13	−07	01	−09	1 00																		
	Critical acclaim	−05	11	−07	−11	−21	1 00																	
	Level of violence	−03	16	−08	−06	−34	22	1 00																
	Level of profanity	−23	−12	−07	05	−34	15	45	1 00															
	Level of sexuality	−03	06	−14	−23	00	32	08	22	1 00														
	Level of drug use	−18	−00	−06	−10	−10	15	19	33	16	1 00													
	Opening box office	18	20	−08	−04	02	26	08	−33	03	−06	1 00												
	Number of other placements in film	−08	−02	−08	06	09	−30	−44	−13	14	−25	23	1 00											
Execution factors	Number of audiovisual placements	11	12	−09	−07	02	03	−01	−04	17	−07	−05	14	1 00										
	Visual low plot connection	16	37	−00	07	00	−17	10	−01	−01	02	−03	04	10	1 00									
	Visual high plot connection	10	13	02	−07	−08	−05	06	07	−08	−06	−03	−02	05	−13	1 00								
	Visual no other products visible	12	11	11	−10	−03	−03	01	−03	05	−08	−16	00	27	25	23	1 00							
	Audio low plot connection	−16	−08	−11	−09	04	19	−25	−02	12	11	−16	−04	17	−17	−09	−20	1 00						
	Audio high plot connection	−05	−03	−07	−05	16	−14	−20	−10	00	−07	−11	12	36	−01	−01	−03	−07	1 00					
	Audio negative valence	−12	−04	−06	03	06	−01	−13	−01	−04	04	−09	07	−04	−08	−03	−14	38	−03	1 00				
	Star association	−06	−02	−00	−14	12	04	−18	03	20	−03	−12	06	25	−12	17	22	16	28	07	1 00			
	Recurrent character	24	17	−09	−12	00	−03	−05	−08	17	−11	19	02	03	−07	13	03	−03	−04	−05	37	1 00		
	Commercially intrusive	00	33	−03	−01	−06	−07	−01	−05	−01	−05	−02	17	21	16	19	10	−06	15	−03	05	00	1 00	
	Number of brands	21	07	06	08	11	−14	−15	−06	00	−04	−09	12	14	24	00	17	−12	24	−04	17	−01	22	1 00

Notes Correlations with an absolute value ≥ 18 are significant at the 05 level Those with an absolute value ≥ 23 are significant at the 01 level information related to earnings, earnings guidance, mergers and acquisitions, spin-offs, stock splits, changes in key executives, layoffs, restructurings, joint ventures, lawsuits, major new product announcements, regulatory announcements, stock buybacks, and unexpected changes in the dividend during a period extending from four days before to two days after the film's opening After we eliminated these confounding events, 126 events remained in our sample (see Table 4)

We gathered daily stock returns from the University of Chicago's Center for Research in Security Prices Following recommended guidelines (Cowan 2003), we estimated parameters of the market model for each firm over an estimation window of 255 trading days, ending 46 days before the event, using the Center for Research in Security Prices equal-weighted index to model the market portfolio In the event study and the cross-sectional analysis, all statistical tests are two-tailed

Event Results and Discussion: The Worth of Product Placement in Successful Films

To allow for any uncertainty regarding when the information was available to investors, common event study practice is to determine the event window empirically (Agrawal and Kamakura 1995, Brown and Warner 1985) Because the final print arrives in theaters two days before the release date (Thomas 1998) and the film is screened for critics and promotional audiences before release, the most plausible days to observe investor reaction are –2, –1, 0, and 1 However, we also include the results for –5, –4, and –3 days to investigate possible leakage The sample cumulative average abnormal returns (CAARs) and test statistics over the possible event windows appear in Table 5.

Using the portfolio test statistic (Jaffe 1974), we document a significant, positive CAAR for the [–2, –1] and [–2, 0] event windows Because the print arrives in theaters two days before release and the film is shown in advance of its opening for critics and promotional audiences, these windows fit our expectations Although not all investors will be aware of the placements in these initial screenings, the market can become aware of this information because markets can aggregate information in a rational manner (Ball 1995) The results are qualitatively and quantitatively similar for the two windows, but we focus on the [–2, 0] window because certain film-level information, such as the film's critical acclaim and the weekend box office, is not known with precision until the day the film opens (Coyle 2006)

Thus, placement in a successful film is associated with an average increase in firm stock prices of 89% over the film's opening, in support of H_1 The significant associated binomial proportionality test statistic (Z) provides additional support for the robustness of the film product placement's positive abnormal return (74 of 126 abnormal returns are positive, $Z = 2\ 18$, $p < 05$) Furthermore, the Wilcoxon rank test is significant ($Z = 1297\ 50$, $p < 05$), indicating that our result is not due to outliers (McWilliams and Siegel 1997) Figure 2 shows the plot of the CAARs from –2 to 10 days after the event, which reveals nontransitory effects for film placement, suggesting that the market value boost is not short lived On a per day basis, these abnormal returns are similar to the 54% two-day CAAR found for celebrity endorsements and the 87% three-day CAAR for television documentary featurettes (Agrawal and Kamakura 1995, Takeda and Yamazaki 2006) The 89% abnormal return corresponds to an average $296 5 million gain in market value for firms in our sample and a gain of approximately $18 5 million for the average NYSE-/NASDAQ-traded firm[1]

We note that event studies in marketing traditionally use the press announcement as the event However, we believe that the initial press announcement does not provide sufficient information for investors, because investors cannot gauge how consumers will respond to the placement until they know how the product appears in the film, and this information is not known until the film is shown Furthermore, film-level characteristics are difficult to judge before the film's release (Liu 2006) To confirm that we appropriately specified our event, we examined investor reaction to the press announcements of film product placements A Factiva database search identified 25 press announcements of a product placement before the [–2, 0] event window After we removed the 9 announcements with confounding information, a model employing the same estimation parameters documented no significant abnormal return for the remaining 16 announcements $\text{CAAR}_{[-1,\,0]} = -48\%$, t-statistic = -53, $\text{AR}_{[0,\,0]} = -42\%$, t-statistic = -67, $\text{CAAR}_{[0,\,1]} = -47\%$, t-statistic = -52 This suggests that there is no stock price movement associated with the announcement of a film placement in the press, which supports our view that the press report does not provide sufficient information for investors to evaluate the placement

However, two additional analyses suggest that this publicity encourages investor attention to the film and provides clues as to how the market is informed of placement information First, we conducted interviews with managers from eight firms that had engaged in product placement activities in our sample and with six investment analysts These firms indicated that their placement publicity is primarily designed to build consumer awareness for the placement, but they also sometimes communicate placement information directly to the financial community by discussing placements during quarterly analyst calls and by distributing press releases In general, analysts appeared cognizant of film product placement's positive effects and noted that the market is keyed to film placement by these press releases and the trade press, through the firm's consumer promotions, and also by firm earnings calls Second, we compared the abnormal returns between announced and unannounced placements to test the idea that this publicity draws additional attention to the film's release, as the investor recognition hypothesis would suggest (Merton

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[1] We also investigated the long-horizon abnormal returns associated with product placement in successful films, using calendar-time Fama–French three-factor model portfolio regressions (e g , Sorescu, Shankar, and Kushwaha 2007) These results for one-year and two-year postevent periods are not significant, suggesting that the effect of the film placement is completely impounded into the stock at the time of the event

TABLE 4
List of the Film Product Placement Events in the Sample

Movie	Firm[a] (Product[b])
8 Mile	Energizer, Heinz
Austin Powers in Goldmember	Apple, eBay, Ford (Jaguar), FedEx, General Motors (Cadillac), Mandalay Bay (Circus Circus), Pepsi, Playboy
Barbershop	Darden (Red Lobster), Gillette, General Motors (Cadillac), Kraft (Planters, Grape Nuts), Pepsi, Toyota (Camry), Tribune (*Chicago Tribune*),
Blade II	Ducati, Krispy Kreme, Olin (Winchester), TDK
Catch Me If You Can	American Airlines, Continental, General Motors (Cadillac), JPMorgan Chase (Chase Manhattan), Coca-Cola, Sara Lee, United Airlines, Unilever (Good Humor)
Die Another Day	British Airways, Ford (Aston Martin, Jaguar), Phillips, Sony
Insomnia	Tribune (*Los Angeles Times*)
Jackass The Movie	Danone (Evian), Matsushita Electric (Panasonic), Pioneer, Vans
John Q	Coca-Cola, AB Volvo (Mack)
Men in Black II	Coca-Cola, DaimlerChrysler (Mercedes), eBay, Hasbro (Twister), Honeywell, Limited Brands (Victoria's Secret), Sony, Pepsi, Sprint
Minority Report	American Express, Diageo (Guinness), Gap, Luxottica (Bvlgari, Revo), Nokia, Pepsi (Pepsi, Aquafina), RadioShack, Toyota (Lexus), Unilever (Ben & Jerry's)
Mr Deeds	Anheuser-Busch (Budweiser), Disney, Kodak, General Electric (NBC), General Motors (Corvette), Hershey (Bubble Yum), Kellogg (Special K), Kraft (Cocoa Pebbles), Krispy Kreme, Pepsi, Procter & Gamble (Old Spice), Wendy's, Wrigley
Panic Room	Anheuser-Busch (Budweiser), Danone (Evian), Energizer, General Electric (NBC), Matsushita Electric (Panasonic), Nokia, Procter & Gamble (Nyquil), Sony
Red Dragon	FedEx, Starwood (Sheraton)
Scooby-Doo	Worldwide Restaurant Concepts (Sizzler)
Signs	Coca-Cola, Johnson & Johnson (Tylenol)
Spider-Man	Cadbury Schweppes (Dr Pepper), Ford (Jaguar), Federated Department Stores (Macy's), General Motors (Cadillac), Liz Claiborne, Prudential, SBC (Cingular), Sara Lee (Chock Full o' Nuts), Sony, TDK, VF (Jansport)
Sweet Home Alabama	Anheuser-Busch (Bud Light), Capitol One, Disney (*W* magazine), Fairmont (Plaza), Coca-Cola, Neiman Marcus (Bergdorf), Tiffany, Winn-Dixie
The Bourne Identity	British Petroleum, Estée Lauder, Matsushita Electric (Panasonic)
The Santa Clause 2	eBay, Ford (Mustang), Pepsi
The Sum of All Fears	Brown & Williamson (Kool), Anheuser-Busch (Budweiser), Hilton, Phillip Morris (Marlboro), Reebok, R J Reynolds (Camel), Time Warner (CNN)
The Time Machine	Federated Department Stores (Macy's), Tiffany
XXX	Kodak, General Motors (Corvette), IBM, Motorola, Pearson (*Financial Times*), Sony, Vans
We Were Soldiers	Amerco (U-Haul)

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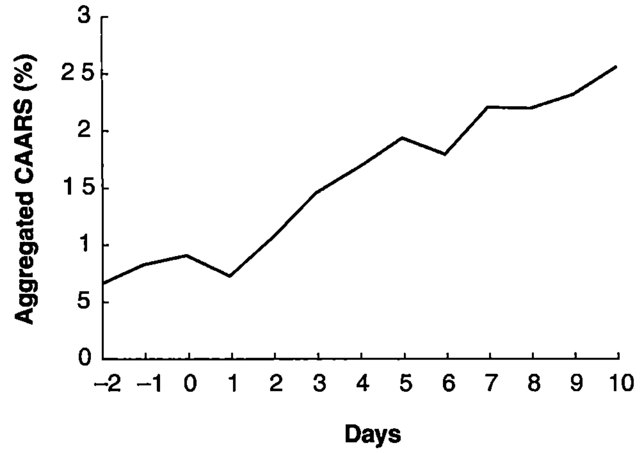
[a] Firms with placements that had earnings announcements are not listed
[b] If different from name of firm Some firms had additional products in the film

TABLE 5
CAARs for Product Placements in Successful Films

Event Wındow	CAAR (%)	Jaffe (1974) Portfolio t-Statistıc	Sample Sıze (n)	Number with Positive Abnormal Returns (%)	Wilcoxon Signed Rank Test	Binomial Z-Statıstic
–5, –1	34	93	126	71 (56)	448 50	1 65*
–5, 0	42	93	126	63 (50)	215 50	22
–5, 1	24	23	126	60 (48)	–4 50	– 31
–4, –1	55	1 41	126	71 (56)	887 50**	1 65*
–4, 0	63	1 36	126	70 (56)	727 50*	1 47
–4, 1	45	52	126	65 (52)	298 50	58
–3, –1	70	1 59	126	79 (63)	1152 50**	3 07**
–3, 0	78	1 62	126	75 (60)	995 50**	2 36**
–3, 1	60	58	126	66 (52)	445 50	76
–2, –1	81	2 29**	126	78 (62)	1412 50**	2 90**
–2, 0	89	2 23**	126	74 (59)	1297 50**	2 18**
–2, 1	71	1 09	126	70 (56)	769 50*	1 47
–1, –1	17	95	126	68 (54)	351 50	1 11
–1, 0	25	89	126	59 (47)	–86 50	– 49
–1, 1	07	– 46	126	60 (48)	–392 50	– 31
0, 0	08	29	126	60 (48)	–275 50	– 31
0, 1	– 10	–1 09	126	47 (37)	–891 50**	–2 63**

*$p \leq$ 10
**$p \leq$ 05

FIGURE 2
Aggregated CAARs Over Time



1987) The results suggest that there ıs a posıtıve relatıonshıp between film placement announcement and the magnıtude of the [–2, 0] abnormal return ($M_{\text{Announced}}$ = 1 84, n = 25, $M_{\text{Unannounced}}$ = 65, n = 101, $F_{1,124}$ = 3 64, p = 06) Thıs supports the ıdea that prerelease publıcıty strengthens the market's attentıon to the film and the placement and draws ınvestors to ınvestıgate the film [2]

Cross-Sectional Regression Results and Discussion

We tested our remaınıng hypotheses by regressıng the standardızed abnormal return from the event wındow [–2, 0] on our ındependent varıables and controls Followıng Agrawal and Kamakura (1995), we used the firm's standardızed abnormal return as the dependent varıable to reduce the problem of heteroskedastıcıty Cross-sectıonal results appear ın Table 6

Results from the firm, film, and executıon controls The control model ıs sıgnıficant ($F_{18,\,107}$ = 4 08, $p <$ 01) Our findıngs ındıcate that the standardızed abnormal return ıs posıtıvely assocıated wıth audıence sıze ($b_{\text{Openıng}}$ = 19, p = 06), but the number of competıng placements ın the film has a deleterıous effect ($b_{\text{\# of other placements ın film}}$ = – 08, $p <$ 01) The abnormal return ıs unrelated to the film's profanıty, sexualıty, and drug use Furthermore, we find that the worth of product placement ın successful films ıs largely unrelated to the executıon factors of plot connectıon, promınence, and valence Assocıatıon wıth a star has no effect on placement worth, but paırıngs wıth recurrent characters are valuable ($b_{\text{Recurrent character}}$ = 2 52, $p <$ 01) Placıng multıple brands ın the film enhances the firm's abnormal return ($b_{\text{\# of brands}}$ = 1 53, $p <$ 01), but our evıdence suggests that blatancy has a dampenıng effect ($b_{\text{Blatant placement}}$ = –1 74, p = 08) The firm's standardızed abnormal return ıs unrelated to the firm's market value

Results ıncludıng the ındependent varıables The full model ıs sıgnıficant ($F_{22,\,103}$ = 4 91, $p <$ 01), wıth a hıgher adjusted R-square The superıorıty of the full model ıs further supported by ıts lower Bayesıan ınformatıon crıterıa value ($BIC_{\text{full model}}$ = 1090 52, $BIC_{\text{controls only}}$ = 1104 10), despıte ıts addıtıonal parameters

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[2] The sıx analysts dıd not attend film screenıngs, but they thought that some ınvestors would, and they belıeved that the market reacts posıtıvely to film placements because placements can create buzz and top-lıne consumer demand

TABLE 6
Cross-Sectional Regression Results: Dependent Variable: CAAR in Percentage (Over Days t = –2 to 0)

Independent Variable	Model 1: Firm, Film, and Execution Controls Parameter Estimate	Model 1: t-Value	Model 2: Independent Variables + Controls (Full Model) Parameter Estimate	Model 2: t-Value
Intercept	–.47	–.38	12.82***	3.14
Hypotheses				
H_2 Tie-in advertising (+)			2.19***	2.70
H_3 Brand equity (+)			.02**	2.01
H_4 Audience absorption (–)			–2.69***	–2.98
H_5 Critical acclaim (–)			–.04**	–2.12
H_6 Film violence (–)			–.53**	–2.42
Firm Controls				
Market value	.00	1.04	–.00	–.71
Film Controls				
Opening (in tens of millions of dollars)	.19*	1.87	.31**	2.56
Profanity	–.15	–1.10	–.01	–.03
Sexuality	.09	.50	.32*	1.72
Drug use	–.18	–.92	–.36*	–1.82
Number of other placements in film	–.08***	–3.22	–.14***	–3.88
Execution Controls				
Modality				
Number of audiovisual placements for firm in film	1.48	1.61	1.93**	2.23
Visual Placement Execution				
Low plot connection	.02	1.13	.01	.55
High plot connection	.02	1.19	.01	.88
No other products visible	–.03	–.06	–.23	–.44
Audio Placement Execution				
Low plot connection	–.48	–1.18	–.68*	–1.75
High plot connection	–.51	–1.10	–.56	–1.29
Negative valence	.34	.30	.75	.72
Other Execution Factors				
Star association	–.58	–1.04	–.67	–1.30
Recurrent character	2.52***	3.32	1.50**	2.01
Blatant placement	–1.74*	–1.79	–1.91**	–2.04
Number of brands	1.53***	3.92	1.45***	4.01
Observations	126		126	
R^2	.39		.51	
Adjusted R^2	.30		.41	
F-value	4.08		4.91	
F-probability	< .01		< .01	
Bayesian information criteria	1104.10		1090.52	

$^*p < .10$
$^{**}p \leq .05$
$^{***}p < .01$

We find strong support for the idea that placement worth is contingent on the product and film factors affecting consumers' response to placements. The abnormal return from the placement is enhanced by the presence of a tie-in advertising campaign ($b_{\text{Tie-in advertising}} = 2.19$, $p < .01$), in support of H_2. We also find that placement worth is positively related to the product's brand equity ($b_{\text{Brand equity}} = .02$, $p < .05$), in support of H_3. These results suggest that though firms cannot control how products appear in the film (Cowlett 2000), firms' brand and promotional decisions can bolster placement value.

The results also indicate that film factors explain a significant amount of the variance in investor reaction. We find that audience absorption has a dampening effect on placement worth ($b_{\text{Absorption}} = -2.69$, $p < .01$), in support of H_4.[3]

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[3] Following the suggestion of a reviewer, we also considered that absorption's effect might be nonlinear. To test this, we entered the square of the mean-centered variable into our final model to reduce multicollinearity (Aiken and West 1991). However, the quadratic CinemaScore term is not significant ($b_{\text{CinemaScore}^2} = -3.10$, $p = .15$, $b_{\text{CinemaScore}} = -4.01$, $p < .01$), and the low variance

The predicted attenuating effect of critical acclaim (H_5) receives support ($b_{\text{Critical acclaim}} = -.04$, $p = .04$).[4] We also find that the worth of the film product placement is diminished by the film's violence ($b_{\text{Film violence}} = -.53$, $p = .02$), in support of H_6. Furthermore, our results do not suggest that product type moderates violence's attenuating effect.[5] With regard to the other types of offensive subject matter, we find weak evidence that drug use in the film dampens returns ($b_{\text{Drug use}} = -.36$, $p = .07$) and sexuality enhances returns ($b_{\text{Sexuality}} = .32$, $p = .09$), but film profanity has no effect. Regarding our result for film sexuality, studio films rarely display the kind of graphic sexuality and nudity that may negatively impact placement worth (Epstein 2005). Finally, we find evidence for saturation effects in that many placements in the film tend to dampen placement value.

We find that the effects of the control variables are largely consistent between the two models. We continue to find positive relationships between opening weekend gross, recurrent character associations, and the number of brands in the film and the firm's standardized abnormal return. The attenuating effects for blatancy and competitive interference continue to hold as well. Furthermore, we find strong evidence that audiovisual placement enhances the placement's return, and we find weak evidence that low-plot audio placements are less valuable. Although prior studies have found support for the role of plot connection and prominence, our results suggest that these factors are subordinate to the effects of other execution factors and the effects of the program.[6]

Placement worth is also enhanced when the product is associated with an established screen character but not when the product is associated with a star. We continue to find no effect for star association even when we consider only major stars, namely, the actors appearing on *Entertainment Weekly*'s list of the 50 most powerful entertainers in 2002 ($b_{\text{Major star}} = -.65$, $p = .31$). These results suggest that the symbolic meaning is carried more by the character and the film than by the actor's celebrity. Prior research has shown that consumer response to placements is enhanced by parasocial character attachments (Russell and Stern 2006), but our study is the first attempt to disentangle the relative worth of star versus character associations.

Results using robust regression. As a robustness check, we reestimated our model by employing a robust regression procedure. Following Venables and Ripley (2002), we use the MM-estimator, developed by Yohai (1987), which is an M-estimator with initial coefficients given by a bisquare S-estimate and with scale given by the S-estimator. Thus, MM-estimation combines the high breakdown property of the S-estimator (.25) and high efficiency (.95) (see Yohai 1987). The results remain largely the same under the robust regression (see Table 7). We continue to find significant effects for all the hypothesized product and film factors, which suggests that these findings are robust. The robust regression estimates for the number of brands, the number of other placements in the film, audience size, and audiovisual placement are also significant, thus strengthening confidence in these results. However, the robust estimates provide weaker evidence for the effects of placement blatancy and recurrent characters.

In summary, by simultaneously considering the effects of product, film, and execution factors, we present a more comprehensive picture of the factors driving placement worth. This study expands the product placement literature by providing new insights into the effect of program factors—the film's absorption, critical acclaim, and violence—on placement outcomes. The study also provides the first evidence for the importance of tie-in advertising and brand equity, and it provides evidence for the value of recurrent character associations and the pernicious effects of placement blatancy. The multiplicity of factors shown to affect placement worth highlights the importance of complementing experimental and intercept studies of placement execution with comparisons of outcomes across brands and programs.

Limitations

Our conclusions are subject to several limitations, which should be addressed in further research. First, we restricted our examination of film product placement worth to the films with the largest opening audiences in 2002. Our significant result for the film's opening strongly suggests that there could be a critical audience size threshold before investors consider a placement worthwhile. Research on a random sample of films across multiple years is needed to determine whether placements in smaller films produce similar effects on firm market value. However, the substantial increase in customer traffic to the Internet dating site featured in *Must Love Dogs* (Turnquist 2005) provides some evidence that placements in less popular films may be worthwhile as well. Furthermore, care should be taken when generalizing our cross-sectional findings because our sample primarily comprises absorbing, successful films.

Second, our sample is limited to films released in 2002, and we cannot eliminate the possibility that there is something idiosyncratic to this year. However, because consumers' resistance to traditional television advertising and

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inflation factors for the CinemaScore terms (3.07) suggest that multicollinearity did not influence these results.

[4] We also examined an alternative measure of critical acclaim—the average critics' grade from *Entertainment Weekly*. The results are similar using this measure ($b_{\text{EW's average critics' grade}} = -.85$, $p = .06$), and the significance of the other hypothesized factors does not change.

[5] Interactions between violence and male-centered product categories are not significant ($b_{\text{Film violence} \times \text{motorcycle}} = .05$, $p = .95$, $b_{\text{Film violence} \times \text{beer}} = .04$, $p = .94$). We also find no interaction between violence and brand equity ($b_{\text{Film violence} \times \text{brand equity}} = .00$, $p = .70$), suggesting that brand equity does not mitigate violence's effects.

[6] If we remove these variables, plot connection and prominence-related factors display stronger effects. Low-plot visual screen time has a positive impact ($b_{\text{low-plot visual time}} = .04$, $p = .06$), and low-plot audio placement has a negative association with placement worth ($b_{\text{low-plot audio placement}} = -.96$, $p = .03$), consistent with prior consumer-related findings (Russell 2002). This strengthens our argument that these factors are subordinate to program-level (i.e., film-level) effects.

TABLE 7
Robust Regression Results: Dependent Variable: CAAR in Percentage (Over Days t = –2 to 0)

	Full Model	
Independent Variable	**Parameter Estimate**	**Chi-Square**
Intercept	12 46***	8 47
Hypotheses		
H_2 Tie-in advertising (+)	1 81**	5 54
H_3 Brand equity (+)	03**	5 73
H_4 Audience absorption (–)	–2 60***	7 66
H_5 Critical acclaim (–)	– 04**	5 10
H_6 Film violence (–)	– 55**	5 40
Firm Controls		
Market value	– 00	48
Film Controls		
Opening (in tens of millions of dollars)	33***	7 00
Profanity	04	04
Sexuality	29	2 28
Drug use	– 37*	3 72
Number of other placements in film	– 13***	17 47
Execution Controls		
Modality		
Number of audiovisual placements for firm in film	1 61**	4 07
Visual Placement Execution		
Low plot connection	01	37
High plot connection	01	42
No other products visible	– 12	06
Audio Placement Execution		
Low plot connection	– 59*	2 82
High plot connection	– 50	1 48
Negative valence	63	39
Other Execution Factors		
Star association	– 69	2 14
Recurrent character	1 33	2 44
Blatant placement	–1 58*	3 55
Number of brands	1 30***	17 44
Observations	126	
Robust R^2	34	

*$p \leq$ 10
**$p \leq$ 05
***$p <$ 01

the fragmentation of television audiences continue to increase (*The Economist* 2007), investors may now be more enthusiastic about product placements in successful films However, film placement's worth may become attenuated if the increasing prevalence of placements increases saturation effects Research needs to assess how the shifting communications landscape affects film placement's worth over time

Third, our research rests on the assumption that the abnormal return we observe is driven by the appearance of the product in the film We assume that investors draw conclusions about the firm's future profitability as a result of film placement and that this information is reflected in the movement of the firm's stock price Therefore, an additional caveat is that the event study methodology does not identify the precise mechanism for explaining why the abnormal return occurs (Bayus, Erickson, and Jacobson 2003) Given the prior research documenting consumers' attitudinal and behavioral responses to placements, we assumed that investors react to the placement according to how they believe the placement will affect consumers (and the resulting earning impact), and we provided some evidence to support this view, additional data from the investment community are needed to validate this assumption more fully Furthermore, additional research is needed to tie film product placement more directly to firm revenues and profits, enabling return-on-investment comparisons between placements and other types of marketing communications

Finally, two limitations associated with our event study procedure may also have an impact on our findings First, many events can cause changes in both stocks' return and volatility, and this event-induced heteroskedasticity, if present, can inflate associated test statistics Currently, finance scholars (e g , Battalio, Ellul, and Jennings 2007) compensate for this by using a standardized cross-sectional test, as suggested by Boehmer, Musumeci, and Poulsen (1991) However, this method stipulates that securities' residuals be cross-sectionally uncorrelated, thus, it does not seem to be possible to control for both event-induced heteroskedasticity and cross-sectional dependence in the securities' residuals simultaneously The results from Breusch and Pagan's (1980) test indicate that there is cross-sectional dependence in the residuals in our sample, and therefore we are unable to control for possible event-induced heteroskedasticity, and this is a limitation of our study Second, thin security trading can introduce bias into the estimates of the market model Following recent finance literature (Avramov, Chordia, and Goyal 2006, McNally and Smith 2007), we implicitly controlled for illiquid penny stocks by excluding from our sample all the shares trading at prices below $1 Note that other authors employ a stricter $5 cutoff criterion to minimize this bias (e g , Zhang 2006) However, the three firms in our sample with stocks priced below $5 are regularly traded, with more than a million shares traded per day, therefore, the more inclusive criterion seems to be more appropriate for our sample

Implications

Implications for Further Research

Our theoretical framework explains a substantial amount of the variance in the worth of placements in successful films, but the inclusion of additional factors might yield a more comprehensive understanding Scholars have suggested that the value of an endorsement depends on the match between the celebrity and the product (McCracken 1989) Extending this logic, we suggest that the worth of film product placement could depend on the match of the product, the film, and the film's audience Although we can point to examples in which fit likely contributed to the placement's positive abnormal returns (e g , Vans in *XXX*), a more comprehensive examination is needed of how placement worth is enhanced by the congruence of the film's thematic elements and the brand's overall strategy and how this is moderated by the degree of overlap in the brand's and the film's target audiences Evidence also suggests that products with the right fit can transcend the negative effects of other film factors For example, the motorcycle manufacturer Ducati had positive abnormal returns from placement in the violent *Blade II*, and the soaring sales of pinot after *Sideways* suggest that product placements in acclaimed films can succeed when product–film–audience fit is organic

For certain product categories, however, we expect fit to be a secondary concern Logic suggests that tobacco firms disproportionately benefit when their brands appear on film because of the restrictions on tobacco advertising We find that investors react positively when cigarette brands appear in films ($b_{Tobacco} = 2\ 57, p = \ 04$), a result that may be troubling to regulators

Another element that has not been specifically addressed is the worth of placements in period films Cultural consumption meanings and associations may be altered when the film depicts characters and situations occurring in the past, dampening placement worth In *Catch Me if You Can*, Leonardo DiCaprio's purchase of a Cadillac for his father may have harmed the brand by reinforcing the perception that Cadillac is the choice of an older generation

Also warranting further investigation is why investors do not reward placements with stars One reason could be that the star's involvement with the product is attributed to external causes, such as studio demands, which limits the transfer of the celebrity's associations A second reason could be that investors' reactions are tempered by the character the star plays on-screen Research is needed to examine the impact of character associations when consumers hold either negative or ambivalent associations with the character

Finally, as research on product placement continues to accumulate, it is necessary to investigate the extent to which placement findings do not generalize across mediums For example, consumers may be more tolerant of blatant placements in television because broadcast television is a free, advertising-supported medium Thus, differences in television and film viewing habits (Russell and Stern 2006) may also alter the factors that drive placement worth

Implications for Practice: Managing Film Placements

For firms, this research provides the first evidence that investors consider film placement a wise marketing practice Furthermore, the results provide new guidance for firms as they consider product placement opportunities, encouraging firms to consider audience absorption, the film's violence, and the film's critical acclaim in their placement decisions Firms can use cues such as the script, the director, and the studio to make informed judgments about how the film will perform on these dimensions, but firms should be cautious when the script suggests exposure that would disrupt the film

However, the results also highlight the difficulties involved in choosing which film placement opportunities to pursue For example, critical acclaim and violence increase the size of the film's audience (Basuroy, Chatterjee, and Ravid 2003, Eliashberg and Shugan 1997), which enhances placement worth, but these film factors also lead to negative consumer responses, which inhibit placement value Star association has no direct effect on placement worth, but stars increase the number of consumers who see the film (e g , Elberse 2007) Therefore, this suggests that firms can face trade-offs between the number of consumers exposed to the placement and the quality of consumer response, and thus firms should consider a multiplicity of factors when selecting films for placement It would not necessarily be wise to avoid enjoyable, absorbing films or violent films—because these films tend to perform well at the box office—but when firms are confident that a film will be a blockbuster, they should not be inattentive to absorption and violence and their deleterious effects

A further challenge then for firms is predicting the film's box office success Although there are a few guideposts for which films are likely to perform well (i e , sequels, prediction markets), it can be difficult to predict whether a particular firm will be successful This challenge is most acute when a firm makes a substantial investment in a film, only to have it disappoint at the box office To mitigate their risk, firms could negotiate "make-good" placements, as in traditional advertising, if the film's audience fails to meet expectations Firms could also encourage the development of a "scatter" market—for placements that could be inserted during postproduction—because forecasts of a film's box office success are more accurate after initial test screenings A portfolio strategy could also diversify the risk associated with film performance

Implications for Practice: Measuring and Pricing Placements

For practice, this research offers three clear recommendations for placement measurement and pricing First, although there is no one accepted measure for valuing product placements, the current services compare the film placement's exposure with the cost and effectiveness of an equivalent 30-second television commercial (Shiller 2004, 2008) The event study approach complements these other efforts because the event study captures the worth of product placements, such as James Bond's car, in which the placement's value far exceeds the costs of an equivalent television exposure

Second, this research offers the potential to improve other product placement valuation methods The current models account for the differences in placements due to the placement's modality, prominence, plot connection, and star association (*The Economist* 2007, Shiller 2004) What these models fail to capture, however, is how the audience's response to the program affects placement value Our research indicates that program effects, such as absorption and violence, significantly influence placement worth

Third, studios price each film product placement on a case-by-case basis based on what firms are willing to pay (Schiller 2004) Thus, our findings offer guidance to studios in setting their product placement rates by identifying the relative benefits of specific film and execution factors Although firms are concerned about the costs of placements in top movies, the results indicate that placements in successful films generate positive stock returns on average Our results also indicate that firms' beliefs about the worth of high plot connection and star association (Karrh, McKee, and Pardun 2003, Russell and Belch 2005) may need to be reconsidered

Appendix

Several studies in the finance and accounting literature have pointed out the potential effect of the cross-sectional correlation problem of residual returns in hypothesis testing when events share a common date (e g , MacKinley 1997) Cross-sectional dependence in the returns biases the standard deviation estimate downward, inflating the associated test statistics Jaffe (1974) and Mandelker (1974) introduce the portfolio method to correct for this bias Adopting their methodology, we form a portfolio for every day in calendar time by including all securities that experience an event at that time—for example, if there are several firms that have product placements in the same movie or if there are several movie openings on the same day For each portfolio, the securities and their return measures are equally weighted We begin by calculating the average abnormal returns AAR_{Pt} for all portfolios

$$\text{(A1)} \qquad AAR_{Pt} = \frac{\sum_{i=1}^{S} AR_i}{S},$$

where S is the number of securities in portfolio P and AR_i is the abnormal return for stock i in portfolio P Next, for every portfolio P, we calculate a time-series estimate of $\sigma(AAR_{Pt})$ for the preceding k days, assuming that the AAR_{Pt} are independent over time Then, we standardize each portfolio's average abnormal return by dividing by the estimated standard deviation

$$\text{(A2)} \qquad SAAR_{Pt} = \frac{AAR_{Pt}}{SD(AAR_{Pt})}$$

Then, we calculate the average standardized residual across all portfolios in calendar time

$$\text{(A3)} \qquad ASAAR = \frac{1}{n}\sum_{t=1}^{255} SAAR_{Pt} \times D_t,$$

where $D_t = 1$ when there is at least one security in portfolio t and $D_t = 0$ when there are no securities in portfolio t, n is the number of days in which the portfolios have at least one security

$$\text{(A4)} \qquad n = \sum_{t=1}^{255} D_t$$

Finally, we estimate the cumulative average standardized average abnormal returns

$$\text{(A5)} \qquad CASAAR_{S_1, S_2} = \sum_{t=S_1}^{S_2} ASAAR$$

If the ASAAR are independent over time, the standard deviation of the $CASAAR_{S1, S2}$ is as follows

$$\text{(A6)} \qquad \sigma(CASAAR_{S_1, S_2}) = \sqrt{S_2 - S_1 + 1} \times \sqrt{1}$$

Then, the test statistic is as follows

$$\text{(A7)} \qquad t = \frac{CASAAR_{S_1, S_2}}{\sqrt{S_2 - S_1 + 1}}$$

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Christian Homburg, Jan Wieseke, & Torsten Bornemann

Implementing the Marketing Concept at the Employee–Customer Interface: The Role of Customer Need Knowledge

Although the identification of customer needs constitutes a cornerstone of the marketing concept, the accuracy of frontline employees' perceptions of customer needs has never been examined in a systematic manner. Following research in social cognition, this article introduces the concept of "customer need knowledge" (CNK), which describes the extent to which a frontline employee can accurately identify a given customer's hierarchy of needs. The results of two large-scale, multilevel investigations involving data from three different levels (customers, employees, and managers) demonstrate the importance of CNK for the provision of customer satisfaction and customer value. In particular, CNK fully mediates the influence of employees' customer orientation and cognitive empathy on these customer outcomes. Moreover, whereas the length of the relationship between an employee and a particular customer enhances CNK, a large age discrepancy in relation to the customer decreases employees' level of CNK.

Keywords: customer need knowledge, employee–customer interface, customer orientation, customer satisfaction, willingness to pay

The accurate identification of other people's preferences and attitudes is a central prerequisite for successful social interaction (Funder 2003). Therefore, it is not surprising that research in social psychology has devoted great efforts to studying the accuracy of interpersonal perception in both personal (e.g., spousal relationships) and professional (e.g., personnel selection, performance appraisal) contexts (Fiske 1993). However, accurate person perception does not constitute an end in itself but rather aims to achieve context-specific interaction goals, such as establishing and preserving relationships (Swann 1984).

The accurate identification of other people's preferences is also central to the marketing concept (Kohli and Jaworski 1990). For example, Saxe and Weitz (1982, pp. 343–44) argue that an organization that follows the marketing concept must "determine the needs of a target market and adapt itself to satisfying needs better than its competitors. The organization seeks to generate customer satisfaction as the key to satisfying its goals."

In many companies, the implementation of the marketing concept is, to an essential degree, up to the frontline employees because of their direct customer interaction (e.g., Gwinner et al. 2005; Liao and Chuang 2004). Moreover, because of considerable heterogeneity of customer needs, it has become increasingly important to successfully address the needs of each specific customer (Van Dolen et al. 2002). Therefore, to implement the marketing concept, frontline employees must be able to form accurate perceptions of an individual customer's hierarchy of needs—that is, they need to develop a high degree of "customer need knowledge" (CNK).

However, although the accuracy of frontline employees' perceptions of customer needs has been assumed to be a key element of the marketing concept and despite its high managerial relevance, it has received little attention in empirical research. An important exception is the work of Weitz (1978), who examined the relationship between the accuracy of salespeople's perceptions of customer needs and salesperson performance. After this first step in studying the concept of CNK, however, research has neglected to investigate this construct further. Therefore, our study focuses on two important aspects related to CNK that have not yet been addressed.

The first area that has received no attention is the predictor side of the CNK construct. An important question

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that arises in this context is whether the degree to which frontline employees practice the marketing concept (i e, their degree of customer orientation, Saxe and Weitz 1982) is indeed linked to their level of CNK, as the marketing literature assumes In addition to customer orientation, research on perceptual accuracy offers other characteristics of the frontline employee and relational aspects of the frontline employee–customer dyad that might influence the level of CNK (Fiske 1993, Funder 2003) Moreover, from a managerial perspective, an important question is whether there are measures that managers can use to influence their frontline employees' degree of CNK (Szymanski 1988)

The second area that has received no attention is how far CNK translates into favorable customer outcomes—that is, does CNK facilitate the implementation of the marketing concept at the employee–customer interface? This is surprising, given that the CNK construct focuses on the interaction between an employee and individual customers

To fill these research gaps, we develop a conceptual model that incorporates predictors and outcomes of CNK Specifically, we follow Gill and Swann (2004, p 407), who state that researchers examining perceptual accuracy first "must identify what types of knowledge [CNK] are likely to serve the goals of perceivers in a given type of relationship [employee–customer interaction] Second, they must determine whether perceivers actually acquire this knowledge [antecedents of CNK] and whether doing so enables them to satisfy their interaction goals [achieving favorable customer outcomes]"

Consequently, we first elaborate on the concept of CNK and its relevance for the frontline employee–customer interaction We then derive potential antecedents of CNK from the marketing literature and the literature on interpersonal perception Finally, we focus on customer outcomes of CNK, specifically on the question whether CNK enables the satisfaction of customer needs and the creation of customer value (Day 1994, Kotler and Armstrong 2004). Such an examination of the causal chain implied by the definition of the marketing concept (degree of practicing the marketing concept → identification of customer needs [CNK] → creation of customer satisfaction and customer value) and the consideration of additional factors that influence CNK will enhance the understanding of how to implement the marketing concept at the employee–customer interface

The previously stated relationships comprise different levels (customers, employees, and managers) A key asset of our research is that we test the CNK framework on the basis of a large-scale, multilevel data set that links data from each of these levels

Framework Development and Hypotheses

CNK

The accurate assessment of customer needs constitutes a central pillar of the marketing discipline For example, Kotler and Armstrong (2004, p 12) state that "the marketing concept holds that achieving organizational goals depends on knowing the needs and wants of target markets" Similarly, Kohli and Jaworski (1990) and Day (1994) highlight the importance of intelligence generation and market sensing, respectively, as prerequisites for achieving customer satisfaction and customer value

Research on the generation of knowledge about customer needs has mostly focused on aggregate levels (i e, the company and market segments) and has stressed the outstanding role of information technology systems (e g, Min, Song, and Keebler 2002, Zhu and Nakata 2007) A notable example for an approach that focuses on identifying the needs of customer segments in a product development context is the "voice-of-the-customer concept" that Griffin and Hauser (1993, p 2) outline "The voice of the customer is a hierarchical set of 'customer needs' where each need (or set of needs) has assigned to it a priority which indicates its importance to the customer"

In many companies, however, the marketing concept must be implemented in the dyadic interaction between single frontline employees and individual customers (Liao and Chuang 2004), which implies that the generation of knowledge regarding these individual customers' needs is up to the frontline employee To shed light on the knowledge generation in the frontline employee–customer interaction, our study examines the accuracy of frontline employees' perceptions of customer needs

Research in social psychology has put forth different approaches to studying the accuracy of interpersonal perception (Funder 1995) Kruglanski's (1989) "constructivist approach" argues that because reality cannot be known apart from people's perceptions of it, accuracy constitutes the degree to which judgments by different observers of the same individual agree with one another The "realistic approach" focuses on the person to be judged and assumes that this person possesses traits that are real in an objective sense This approach aims to identify criteria that influence the accurate assessment of these traits (Funder 1995) Whereas the aforementioned approaches focus on the very nature of accuracy, the "pragmatic approach" proposes that "an adequate conceptualization of the person perception process must consider the interpersonal context in which that process occurs as well as the purpose for which it is intended" (Swann 1984, p 457, see also Fiske 1992) This paradigm conceptualizes accuracy as the degree to which perceivers acquire knowledge that serves their goals in a given type of relationship (Gill and Swann 2004)

In our study, we follow the pragmatic approach to accuracy To create customer satisfaction and customer value in the interaction with individual customers, frontline employees must generate knowledge regarding customer needs However, unlike the voice of the customer concept we described previously (Griffin and Hauser 1993), this knowledge generation pertains to the needs of individual customers (Weitz 1978) Therefore, we define CNK as the extent to which a frontline employee can correctly identify a given customer's hierarchy of needs, that is, CNK is the consistency between a customer's ranking of his or her shopping-related needs and the ranking an employee assumes for this customer Thus, in line with research in social psychology (e g, Blackman and Funder 1998; Gill and Swann 2004), CNK includes both a customer part (i e, the subjective valuing of needs) and an employee part (i.e., the perceived valuing of needs of a specific customer).

Antecedents of CNK

The identification of factors that influence perceptual accuracy constitutes an important research topic in social psychology (Funder 2003). The traditional focus of this research has been on characteristics that make up "the good judge of people" (e.g., Taft 1955). The practical implications seem obvious: "When researchers gain a better understanding of the underlying processes and personality characteristics associated with good and bad judges of personality, training programs can be developed to improve people's judgmental accuracy" (Colvin and Bundick 2001, pp. 49–50). Although research on accuracy training is rather limited in scope and provides ambiguous results, there are indications that certain training measures might improve perceptual accuracy (Spool 1978). More recent studies have broadened the research focus beyond perceiver characteristics and have emphasized the importance of accounting for characteristics of the relationship between perceiver and target as well (Fiske 1993).

From a review of the perceptual accuracy literature, we identify characteristics of the frontline employee, corresponding training programs, and aspects of the relationship between frontline employees and customers that constitute potential antecedents of CNK. Moreover, we relate these determinants to relevant concepts from the marketing and sales literature.

Employee characteristics and training programs. The pragmatic approach to accuracy suggests that when interacting with other people, perceivers try to attain certain goals (Gill and Swann 2004; Swann 1984). These goals determine the information sought in a particular interaction and, in general, are divided into accuracy goals and speed goals (for a review, see Fiske 1992). In the former case, perceivers try to gather accurate information about a target person along dimensions that are relevant to the respective interaction goal (Fiske and Taylor 1991; Hilton and Darley 1991). In the latter case, however, perceivers' information gathering is rather simple and focused on immediate goal attainment (i.e., closure seeking), with the target person being mainly instrumental to the respective goal (Fiske 1992; Hilton and Darley 1991). Empirical research shows that the degree to which perceivers generate accurate knowledge regarding a target person indeed depends on how relevant this knowledge is considered for the achievement of specific interaction goals (Gill and Swann 2004; Neuberg and Fiske 1987).

The marketing literature distinguishes two goals that influence the interaction between frontline employees and their customers: trying to satisfy the needs of customers (following the marketing concept) and trying to increase the probability of making an immediate sale (following the selling concept; Saxe and Weitz 1982). The degree to which frontline employees try to satisfy the needs of customers instead of trying to make an immediate sale is defined as "customer orientation" (Saxe and Weitz 1982). To satisfy customer needs, employees must acquire goal-relevant knowledge—that is, knowledge about these needs (Goff et al. 1997). Following the pragmatic approach to accuracy, we expect that employees who consider the satisfaction of customer needs an important interaction goal will acquire more accurate knowledge regarding these needs than employees who aspire to an immediate sale (Gill and Swann 2004).

> H_1: The customer orientation of a frontline employee has a positive effect on the employee's CNK.

A question that arises in this context is whether there are factors that influence the extent to which customer orientation leads to CNK. Research investigating the relationship between interaction goals and judgmental accuracy points to the possibility that accuracy goals do not necessarily lead to more accurate perceptions because of "perceivers' not knowing that their judgment strategies are inappropriate or not knowing how to overcome them" (Neuberg and Fiske 1987, p. 443; see also Pelham and Neter 1995).

Thus, although frontline employees might exhibit a high degree of customer orientation—"trying to help their customers make purchase decisions that will satisfy customer needs" (Saxe and Weitz 1982, p. 344)—they might not be able to do so because of a lack of the required skills (Pettijohn, Pettijohn, and Taylor 2002). Therefore, training in terms of customer-oriented interaction behavior that emphasizes the conversation skills necessary for gathering accurate information about customer needs should strengthen the relationship between frontline employees' degree of customer orientation and CNK (Liu and Comer 2007; Pettijohn, Pettijohn, and Taylor 2002).

> H_2: Training in terms of customer-oriented interaction behavior positively moderates the effect of the frontline employee's customer orientation on CNK.

In addition to focusing on the motivational role of perceivers' interaction-specific goals, research in social psychology has tried to identify ability-related predictors of perceptual accuracy. Conceptually, this research regards "empathy" as the critical variable necessary for understanding other people (Bruner and Tagiuri 1954; Kenny and Albright 1987). However, because of the complexity of this construct and ambiguity regarding its conceptualization, empirical evidence for the relationship between empathy and perceptual accuracy has remained scarce: "One reason for the field's disarray is that systematic relationships between two major constructs—empathy and accuracy—have not been demonstrated" (Bernstein and Davis 1982, p. 1).

In a broad sense, empathy is defined as the phenomenon that connects two otherwise isolated individuals to each other (Davis 1996). Theoretical discussions on the empathy construct have followed two traditions—defining empathy as either an emotional reaction to or a cognitive understanding of other people's experiences (Duan and Hill 1996). Emotional empathy plays an important role in helping behavior and includes facets such as empathic concern and emotional contagion (e.g., Coke, Batson, and McDavis 1978; McBane 1995). Conversely, cognitive empathy is defined as the ability to understand another person's thoughts and feelings and is also referred to as "perspective taking" (e g , Barrett-Lennard 1981, Dymond 1949, McBane 1995) To substantiate the theoretical link between "empathic ability" and perceptual accuracy, Bernstein and Davis (1982) examine the influence of both cognitive and emotional empathy on perceptual accuracy Their results reveal that only cognitive empathy (i e , the understanding aspect of empathy) is related to perceptual accuracy Therefore, in our study, we adopt the conceptualization of cognitive empathy (Barrett-Lennard 1981, Duan and Hill 1996)

The marketing literature also highlights the potential importance of empathy for successful employee–customer interactions (Aggarwal et al 2005, Giacobbe et al 2006) and commonly adopts the conceptualization of cognitive empathy For example, Pilling and Eroglu (1994, p 47) define empathy as the "ability to understand and identify with the other person's perspective" Although frontline employees' empathic ability has not been examined empirically, several authors propose that it should be related to their knowledge about customer needs (Von Bergen and Shealy 1982) Dawson, Soper, and Pettijohn (1992, p 299) even argue that "the process of understanding the client's needs is analogous to the concept of accurate empathic understanding" Therefore

> H_3 The cognitive empathy of a frontline employee has a positive effect on the employee's CNK

From a practitioner's perspective, the question arises whether and how superordinate managers can influence their frontline employees' empathic ability (Szymanski 1988) Research in social and educational psychology indicates that perceivers' preexisting levels of empathic understanding can be activated and stabilized by instructing them to put themselves in their target's position (Malle and Pearce 2001, Marsh, Serafica, and Barenboim 1980)

In the context of the current study, this implies that training frontline employees to take the customer's perspective should enhance the impact of their preexisting levels of empathic understanding on CNK (Von Bergen and Shealy 1982) Such perspective-taking training can be accomplished by role-playing, in which employees "play" the customer role in a realistic sales interaction (Bettencourt and Gwinner 1996, Szymanski 1988) Therefore

> H_4 Perspective-taking training (i e , role-playing) positively moderates the effect of the frontline employee's cognitive empathy on CNK

Relational aspects The social psychology literature suggests that in addition to perceiver characteristics, relational aspects of the perceiver–target dyad can influence perceptual accuracy (Fiske 1992, Funder 2003) In particular, the accuracy of interpersonal perception is assumed to increase with the length of the relationship between the perceiver and the target (the acquaintance effect, e g , Blackman and Funder 1998) and to decrease with the dissimilarity between the perceiver and the target (the out-group homogeneity effect, e g , Fiske 1993)

Empirical research on the accuracy of interpersonal perception has shown that a high degree of acquaintance increases the level of agreement between judgments about a target person and that person's self-judgments (for an overview, see Letzring, Wells, and Funder 2006) Acquaintance with a target provides perceivers with a more representative sample of the target's behavior across different situations and thus increases the amount of available information (Blackman and Funder 1998, Kilianski 2008) Therefore, the length of the relationship between a frontline employee and a specific customer should influence the amount of information a frontline employee can draw from when trying to identify the customer's needs in a given situation Although the marketing literature suggests that the length of the relationship between employees and customers is related to customer outcomes, little is known about how such an effect could be explained (Gwinner, Gremler, and Bitner 1998, Reynolds and Beatty 1999) In line with the social psychology literature, we propose that relationship length affects employees' perceptual accuracy

> H_5 The acquaintance (i e , length of the relationship) between a frontline employee and a customer has a positive effect on the employee's CNK

When forming impressions of other people, perceivers also attend to information derived from salient cues, such as age, gender, and race (Pratto and Bargh 1991) Using these cues, they categorize targets into in-group members, who are similar to themselves with respect to this cue, and out-group members, who are dissimilar (Linville 1982) Because of lower familiarity with the out-group, perceptions of out-group members (e g , those of the opposite sex) tend to be less accurate than those of in-group members (Judd, Ryan, and Park 1991) The social cognition literature refers to this phenomenon as the out-group homogeneity effect (Fiske 1993)

The similarity of the frontline employee–customer dyad is also discussed in the marketing literature as a potential determinant of sales performance (Davis and Silk 1972, Evans 1963) However, Weitz (1978, p 503) remarks that "without a theoretical basis for this relationship, the implications are ambiguous" Following the social cognition literature, we propose that dissimilarity of the employee–customer dyad with respect to categorization cues should lead to lower levels of perceptual accuracy In our study, we focus on age dissimilarity and gender dissimilarity because these characteristics are considered the most salient categorization cues (Fiske 1993, Linville 1982, Pratto and Bargh 1991)

> H_6 The age discrepancy between a frontline employee and a customer has a negative effect on the employee's CNK
>
> H_7 The gender discrepancy between a frontline employee and a customer has a negative effect on the employee's CNK

Outcomes of CNK

The pragmatic approach to accuracy suggests that "the mark of an optimal or accurate person perception is its ability to promote the interaction goals of perceivers" (Swann 1984, p 461) In the marketing literature, it is assumed that practicing the marketing concept should lead to superior knowledge about a target market's needs (Saxe and Weitz 1982) In turn, this knowledge is assumed to enable the generation of customer satisfaction and superior customer value (Day 1994, Kotler and Armstrong 2004).

Theoretically, customer satisfaction develops when customers' expectations with respect to the performance of a product or service are met (e.g., Bearden and Teal 1983, Oliver 1980). Accordingly, the most common customer satisfaction models, such as the Nordic model of Gronroos (1984) and the SERVQUAL model of Parasuraman, Zeithaml, and Berry (1988), state that customer satisfaction can be achieved only if a certain level of customers' expectations is met. Grewal and Sharma (1991) adapt this conceptualization to frontline employee–customer interactions, arguing that the correct determination of customer expectations by the employee constitutes a prerequisite for customer satisfaction. Therefore, the correct identification of a given customer's hierarchy of needs should result in higher levels of customer satisfaction (Bettencourt and Gwinner 1996, Simester et al. 2000). Therefore

> H_8: The CNK of a frontline employee has a positive effect on customer satisfaction.

The concept of customer value captures a customer's assessment of the value that has been created for him or her and includes a trade-off between all relevant benefits and sacrifices associated with the respective product or service (Flint, Woodruff, and Gardial 1997). Customer value can be conceptualized as the perceived worth in monetary terms—that is, as the customer's willingness to pay (e.g., Flint, Woodruff, and Gardial 1997, Ravald and Gronroos 1996). To provide products and services that the customer values, a company "needs to gain a thorough understanding of the customer's needs" (Ravald and Gronroos 1996, p. 23). In a similar vein, Gwinner and colleagues (2005, p. 131) argue that "buyers value individualized solutions to their specific product and service needs." If they know individual customers' expectation levels, frontline employees can tailor their offering more exactly to this level. For example, knowing that price is of minor importance to a customer and that his or her brand orientation is high would enable an employee to sell a more expensive product easier or even suggest the expensive product in the first place (Sharma and Lambert 1994). Therefore

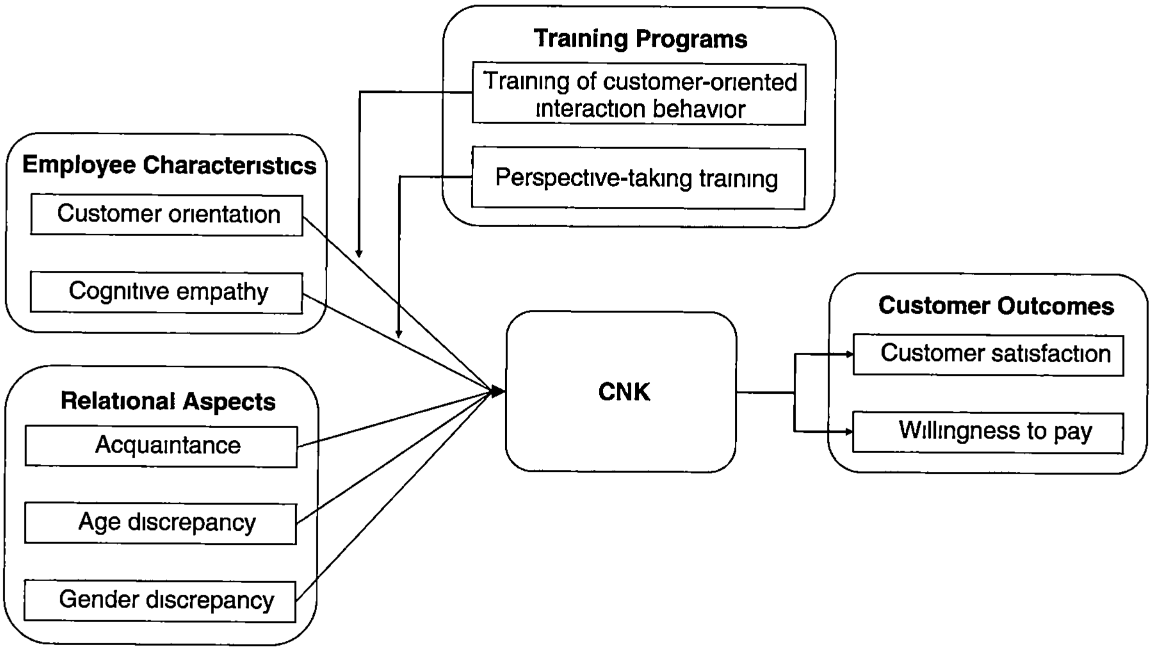
> H_9: The CNK of a frontline employee has a positive effect on the customer's willingness to pay.

Our conceptual model links employee characteristics and relational aspects as antecedents and customer satisfaction and willingness to pay as outcomes of CNK (see Figure 1).

Introducing the intermediate concept of CNK enables an extension of the intensely studied employee characteristics–sales performance relationship. The marketing literature suggests that an employee's customer orientation and his or her empathic ability should enable the generation of customer satisfaction and customer value because both characteristics are assumed to facilitate the identification of customer needs (Beatty et al. 1996, Goff et al. 1997, Spiro and Weitz 1990).

However, the linkage between employees' customer orientation and performance outcomes is far from being well established in empirical research. Whereas a recent meta-analysis by Jaramillo et al. (2007) reveals a positive effect of employees' customer orientation on sales performance, another meta-analysis by Franke and Park (2006) finds no evidence for such an effect. With regard to customer outcomes, Webb, Webster, and Krepapa (2000, p. 101) note that "to date, the marketing literature has failed to substanti-

FIGURE 1
Framework



ate the linkage between market orientation and customer satisfaction" (see also Jaworski and Kohli 1996) The same holds true for empirical findings regarding empathy outcomes in sales contexts Whereas some more recent studies find no relationship between salespeople's empathy and relevant outcomes (Dawson, Soper, and Pettijohn 1992), others do find such an effect (Pilling and Eroglu 1994)

We propose that the inconclusiveness of previous research may in part stem from a "black-box" approach (i.e , not testing for intervening variables), which empirical studies in both areas have applied With regard to customer orientation, for example, Brady and Cronin (2001, p 241) note that "the question as to how a customer-oriented service firm benefits from its customer focus, either directly or indirectly (through its impact on mediating variables), remains unknown" This is in line with Jaworski and Kohli (1996), who suggest the inclusion of intermediate concepts when examining effects of customer orientation In a similar vein, Aggarwal and colleagues (2005, p 18) note against the background of mixed evidence for empathy effects that "a direct link between empathy and outcome variables may prove to be tenuous" Therefore, they suggest that research examining empathy effects should focus on mediating constructs

For both customer orientation and empathy, identifying individual customers' needs is the crucial component that leads to a higher level of customer outcomes Therefore, we suggest that CNK mediates between customer orientation/cognitive empathy and customer outcomes

H_{10} CNK mediates between a frontline employee's customer orientation and customer outcomes (i e , customer satisfaction and willingness to pay)

H_{11} CNK mediates between a frontline employee's cognitive empathy and customer outcomes (i e , customer satisfaction and willingness to pay)

Methodology

Collection of Triadic Data

To test our hypotheses, we conducted two large-scale field studies in German travel agencies The second data collection (Study 2) took place one year after the first one All travel agencies belonged to one large travel organization We chose the travel agency context because of the close employee–customer interaction, which enables us to test the hypotheses of the proposed CNK framework Specifically, it provides an ideal environment to measure the complex core construct of CNK When selecting the travel agencies, we took several steps to make the sample as balanced as possible A key issue was the inclusion of travel agencies from different locations to control for possible external effects that could bias results in a locally clustered sample [1]

We collected data for the study in several stages First, we conducted a qualitative study with in-depth interviews with five managers, 20 employees, and 64 travel agency customers The aim of this study was to generate a list of the main customer needs regarding travel agency services Second, we collected quantitative data For the purpose of measuring CNK, it was necessary to link responses of an employee to the responses of each of his or her customers To achieve the best possible response and matching rates (between employees and customers), interviewers of the research team administered questionnaires personally to employees The interviewers then spent one day in the respective travel agency and asked customers for an interview after their interaction with a travel agent All employees who were at work on the days of the interviews agreed to participate in the study

Data from the three levels (employees, customers, and managers) were matched by using code numbers With respect to the employee–customer link, interviewers allocated the customers to the respective employee's code number In Study 1, the final matched sample consisted of 215 employees and 370 customers (for a response rate of 35 5%) in 92 travel agencies (with one manager per travel agency) The data for Study 2 comprised 105 travel agencies with 237 employees and 489 customers (for a response rate of 37 0%) Furthermore, we were able to conduct several longitudinal tests with a subsample of n = 90 employee data sets, which we could match between Study 1 and Study 2 on the basis of code numbers

In both studies, we undertook efforts to prevent misunderstandings of the items The most important measure in this respect was the provision of professional training for all interviewers to enable the detection of potential difficulties or misunderstandings with the items. In the extensive interviewer records, we found no indication of such problems Moreover, the interviewers interviewed only customers who were interested in leisure travel, which was the case for the vast majority of the travel agency visitors Business travel customers were not interviewed

To test for a nonresponse bias in the customer sample, we chose the following approach All visiting customers during the days of the interviews were offered the chance to participate in a lottery, which was independent from the participation in the interviews To take part in the lottery, customers were required to provide their addresses and telephone numbers We then collected additional data from 70 nonrespondents, contacting them by telephone Regarding the scale means of the customer constructs included in our framework, we did not find any significant differences between the respondents in our original sample and the nonrespondent sample These results provide evidence that nonresponse bias is not an issue with our data

Measures

To enable the comparison of an employee's assumed hierarchy of needs for a given customer with that customer's self-rated hierarchy of needs, we measured CNK using a dual-perspective approach common in perceptual accuracy research (Blackman and Funder 1998, Gill and Swann 2004) Customers were asked to rank six buying needs according to their personal importance (convenience, price, service, brand, security, and shopping enjoyment) After each customer–employee interaction, the employee was asked to take the perspective of the respective customer and to rank his or her buying needs in the same way as the customer

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[1] Seven types of store locations emerged in the sample of travel agencies large city, first-class location, large city, central part, large city, suburb, medium-sized city, small city, airport, and shopping mall However, including store location (operationalized as dummy variables) as a covariate did not exert any significant impact on the relationships we examined, and thus we dropped this variable from further analyses

In line with previous research that has used dyadic difference scores (e g , Durham et al 2000, Wanous and Youtz 1986), we operationalized CNK as the sum of the absolute differences between customer and employee rankings multiplied by –1 Thus, it was scored in such a way that high values reflected a smaller discrepancy between actual and perceived customer needs

A solid derivation of customer needs is an important prerequisite for studying CNK Therefore, we undertook several steps to ensure that we covered the relevant needs of travel agency customers First, we analyzed the relevant literature that addresses shopping needs (e g , Arnold and Reynolds 2003, Dawson, Bloch, and Ridgway 1990, Kaltcheva and Weitz 2006) Second, we conducted interviews with five marketing scholars to generate a pool of additional shopping needs Third, as mentioned previously, we conducted an extensive qualitative study with in-depth interviews In the manager and employee interviews, we generated a list of the six most important shopping needs Additional needs were only mentioned in individual cases In the customer interviews, we first asked the customers to freely indicate their main shopping needs, and then we asked them to rank the list of our six pregenerated motives, supplemented with the customer indications that did not fit into this list Only 2 of the 64 customers indicated needs that did not fit into the pregenerated list Therefore, we are confident that our list of needs (convenience, price, service, brand, security, and shopping enjoyment) covers the main shopping needs of the majority of customers

The Appendix provides a complete list of items used in our study For the most part, we adapted the scales from previous research Table 1 displays the psychometric properties of the measures, and Table 2 provides the correlations of the framework variables Cronbach's alpha, composite reliability, and average variance extracted for all measurement scales indicate sufficient reliability and convergent validity More specifically, no coefficient alpha values and composite reliabilities are lower than 70, thus meeting or exceeding the recommended thresholds (Bagozzi and Yi 1988) We assessed the discriminant validity of the construct measures using the criterion proposed by Fornell and Larcker (1981) All constructs passed this test

To control for multicollinearity, we inspected the variance inflation factors of the variables The variables in our study yielded values between 1 0 and 1 7, indicating that there are no problems with multicollinearity (Kleinbaum et al 1998)

We also controlled for several factors that might influence CNK but are not part of our framework At the customer level, we controlled for purpose of the current trip and family status At the employee level, we controlled for general job know-how and skills (e g , knowledge about travel destinations, handling of travel catalogs, speediness in the usage of booking systems, handling of computer and booking systems)

TABLE 1
Psychometric Properties of Measures

Variables		M	SD	α	CR	AVE
1 CNK ranking-based measure	Study 1	7 82	3 40	—	—	—
	Study 2	8 49	3 13			
1a CNK rating-based measure	Study 2	8 56	5 10	—	—	—
1b CNK destination motives	Study 2	8 23	3 54	—	—	—
2 Customer satisfaction	Study 1	6 41	88	84	85	65
	Study 2	6 45	86	88	88	72
3 Customer willingness to pay	Study 1	37 20	28 50	78	90	69
	Study 2	30 11	20 75	74	87	62
4 Employee customer orientation	Study 1	6 56	47	90	90	64
	Study 2	6 51	71	95	95	79
5 Cognitive empathy	Study 1	5 12	76	82	83	62
	Study 2	5 04	97	83	85	66
5a Empathy perspective taking	Study 2	5 12	1 10	82	68	43
5b Empathy empathic concern	Study 2	5 31	98	85	83	56
5c Empathy emotional contagion	Study 2	3 75	1 20	78	78	43
6 Acquaintance	Study 1	4 26	3 95	—	—	—
	Study 2	4 73	4 64			
7 Employee–customer age discrepancy	Study 1	15 39	12 04	—	—	—
	Study 2	19 25	13 86			
8 Employee–customer gender discrepancy	Study 1	46	49	—	—	—
	Study 2	43	50			
9 Training of customer-oriented interaction behavior	Study 1	5 43	1 44	90	90	75
	Study 2	5 49	1 47	90	90	75
10 Perspective-taking training	Study 1	3 85	2 09	—	—	—
	Study 2	4 77	1 79			

Notes CR= composite reliability, and AVE= average variance extracted

TABLE 2
Correlations of Framework Variables

Variables		1	2	3	4	5	6	7	8	9
1 CNK	Study 1									
	Study 2									
2 Customer satisfaction	Study 1	15**								
	Study 2	16**								
3 Customer willingness to pay	Study 1	11*	02							
	Study 2	20**	10*							
4 Employee customer orientation	Study 1	15**	01	13*						
	Study 2	20**	07	04						
5 Cognitive empathy	Study 1	17**	05	12*	46**					
	Study 2	23**	06	03	28**					
6 Acquaintance	Study 1	17**	08	– 08	– 06	11*				
	Study 2	14**	09*	– 02	01	11*				
7 Employee–customer age discrepancy	Study 1	– 14**	04	– 09	13**	20**	13*			
	Study 2	– 14**	18**	04	02	– 01	– 01			
8 Employee–customer gender discrepancy	Study 1	01	– 07	04	01	01	– 03	– 07		
	Study 2	– 03	– 01	06	– 03	02	02	13*		
9 Training of customer-oriented interaction behavior	Study 1	14**	09	– 11*	– 07	01	19**	11*	– 04	
	Study 2	20**	– 01	09	01	07	07	09	– 02	
10 Perspective-taking training	Study 1	01	11*	02	– 01	07	– 05	24**	– 05	28**
	Study 2	14**	– 03	03	– 02	03	03	06	02	40**

*$p <$ 05 (two-tailed)
**$p <$ 01 (two-tailed)
Notes Correlations between constructs residing at different levels of analysis are based on disaggregated customer scores

Furthermore, to formally test whether any variables that are not specified in the model influence our results, we performed the Ramsey (1969) RESET test This test examines whether additional independent variables have any power in explaining the dependent variable An application of this test to our CNK antecedent model suggests that omitted variables are not a major problem in the regression models of both studies (Study 1 $F_{(3, 350)} = 18$, not significant [n s], Study 2 $F_{(3, 475)} = 78$, n s)

Analytical Approach

The data structure underlying the study comprises three levels We matched customers (Level 1) to employees (Level 2) and managers/travel agencies (Level 3) To account for this data structure properly, we employed hierarchical linear modeling (e g , Raudenbush and Bryk 2002) We conducted analyses using the MLwiN software (Version 2 0, Rasbash et al 2000) All predictor variables were centered on their grand mean

In our analyses, we applied a stepwise approach (see Table 3) We first entered customer-level predictors into the hierarchical linear models Next, we entered variables at the level of employees, followed by manager-level predictors and cross-level interactions In addition, we undertook tests for between-group effects Here, we added aggregated (per travel agency) employee variables to the models The aggregated variables do not significantly contribute to the explanation of CNK in both studies (Study 1 customer orientation b = – 324, SE = 329, n s , cognitive empathy b = 509, SE = 342, n s , Study 2 customer orientation b = 086, SE = 164, n s , cognitive empathy b = – 250, SE = 233, n s) This indicates that the employee characteristics mainly explain within-group variance but not variance between the travel agencies

Results

The results of our hypothesis tests appear in Table 3 In accordance with H_1, we find that employees' customer orientation has a significant effect on CNK in both studies (Study 1 b = 698, SE = 213, $p <$ 01, Study 2 b = 481, SE = 141, $p <$ 01) We also find a significant effect of cognitive empathy on CNK (Study 1 b = 583, SE = 222, $p <$ 01, Study 2 b = 356, SE = 152, $p <$ 01) In Study 2, we also employed a measurement approach for empathy that includes emotional aspects (McBane 1995) The results of these analyses reveal that though cognitive empathy, embodied by a perspective-taking dimension, exerts a strong influence on CNK (b = 773, SE = 153, $p <$ 01), emotional aspects of empathy do not (emotional contagion b = – 067, SE = 135, n s , empathic concern b = – 211, SE = 139, n s) Together, these results provide strong support for an effect of cognitive empathy on CNK, as H_3 predicts

The results regarding the proposed cross-level interactions are mixed Although we find no significant interaction effect of cognitive empathy and perspective-taking training, contrary to the prediction in H_4 (Study 1 b = 035, SE = 212, n s , Study 2 b = 231, SE = 148, n s), there is strong evidence for the interaction effect between customer orientation and training of customer-oriented interaction behavior, in support of H_2 (Study 1 b = 439, SE = 154, $p <$ 01, Study 2 b = 434, SE = 152, $p <$ 01) Moreover, as Figure 2 shows, the effect of training on the relationship between customer orientation and CNK is most pronounced when employees already exhibit a certain degree of customer orientation With respect to the direct effects of training programs on CNK, note that training of customer-oriented interaction behavior also has a significant main effect on

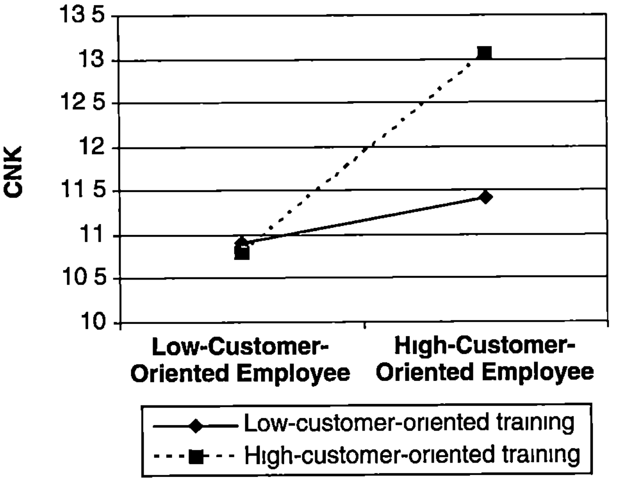
TABLE 3
Estimated Path Coefficients for CNK Predictors

	Study 1			Study 2		
	Unstandardized Coefficient (SE)			Unstandardızed Coeffıcıent (SE)		
Customer-Level Predictors						
Acquaıntance	454 (182)**	411 (181)*	353 (178)*	433 (141)**	379 (136)**	351 (133)**
Employee–customer age dıscrepancy	– 573 (179)**	– 701 (177)**	– 754 (177)**	– 477 (139)**	– 465 (135)**	– 388 (132)**
Employee–customer gender dıscrepancy	007 (169)	008 (165)	015 (163)	160 (138)	114 (136)	151 (133)
Purpose of current trıp (CV)						
Cıty trıp	650 (1 511)	703 (1 477)	943 (1 465)	—[a]	—[a]	—[a]
Beach holıday	543 (1 479)	569 (1 445)	682 (1 433)			
Adventure trıp	1 062 (1 572)	787 (1 538)	911 (1 522)			
Educatıon trıp	392 (1 602)	401 (1 565)	520 (1 549)			
Other trıps	1 332 (1 562)	1 500 (1 527)	1 724 (1 517)			
Famıly status (CV)						
Indıvıdual	2 844 (3 338)	2 934 (3 252)	3 395 (3 190)	—[a]	—[a]	—[a]
Couple/frıend	2 622 (3 329)	2 684 (3 245)	3 125 (3 181)			
Famıly	1 960 (3 338)	1 999 (3 255)	2 453 (3 192)			
Employee-Level Predictors						
Employee customer orıentatıon		529 (214)**	698 (213)**		519 (146)**	481 (141)**
Cognıtıve empathy		548 (229)**	583 (222)**		532 (154)**	356 (152)**
Job know-how and skılls (CV)		– 264 (216)	– 194 (213)		—[a]	—[a]
Manager-Level Predictors and Cross-Level Interactions						
Traınıng of customer-orıented ınteractıon behavıor			382 (176)*			536 (157)**
Perspectıve-takıng traınıng			093 (197)			072 (159)
Traınıng of customer-orıented ınteractıon behavıor × employee customer orıentatıon			439 (154)**			434 (152)**
Perspectıve-takıng traınıng × cognıtıve empathy			035 (212)			231 (148)
Increase ın Model Fit		$\Delta\chi^2$ = 19 43 (d f = 3)**	$\Delta\chi^2$ = 13 50 (d f = 4)**		$\Delta\chi^2$ = 32 12 (d f = 2)**	$\Delta\chi^2$ = 29 08 (d f = 4)**

*$p <$ 05 (one-taıled)
**$p <$ 01 (one-taıled)
[a] Not ıncluded ın the respectıve study
Notes CV = control varıable

FIGURE 2
The Moderating Role of Customer-Oriented Training on the Link Between Employee Customer Orientation and CNK

A: Study 1



B: Study 2

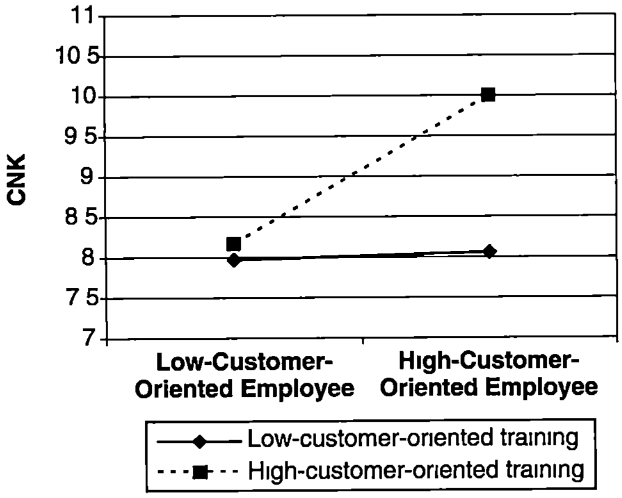


TABLE 4
Estimated Path Coefficients for CNK Outcomes

	Dependent Variables: Unstandardized Coefficients (SE)			
	Customer Satisfaction		Willingness to Pay	
CNK	Study 1	132 (046)**	Study 1	3 387 (1 460)*
	Study 2	142 (038)**	Study 2	3 953 (920)**

*$p < 05$ (one-tailed)
**$p < 01$ (one-tailed)

CNK (Study 1 b = 382, SE = 176, $p < 05$, Study 2 b = 536, SE = 157, $p < 01$)

Regarding the influence of relational aspects on CNK, we find strong evidence for the effects of acquaintance (Study 1 b = 353, SE = 178, $p < 05$, Study 2 b = 351, SE = 133, $p < 01$) and age discrepancy (Study 1 b = −754, SE = 177, $p < 01$, Study 2 b = −388, SE = 132, $p < 01$), as H_5 and H_6 suggest However, we find no support for the influence of gender discrepancy, contrary to the prediction in H_7 (Study 1 b = 015, SE = 163, n s , Study 2 b = 151, SE = 133, n s) Moreover, none of the control variables significantly influence CNK

As we show in Table 4, the data also yield support for the proposed influence of CNK on customer outcomes In support of H_8 and H_9, we find that CNK has a significant, positive effect on customer satisfaction (Study 1 b = 132, SE = 046, $p < 01$, Study 2 b = 142, SE = 038, $p < 01$) and on willingness to pay (Study 1 b = 3 387, SE = 1 460, $p < 05$, Study 2 b = 3 953, SE = 920, $p < 05$)

Another notable aspect is related to the mediating role of CNK between employee characteristics and the examined customer outcomes (see H_{10} and H_{11}) To test for such mediation effects, we followed the multiple-step procedure suggested in Baron and Kenny's (1986) seminal work as well as more recent developments (e g , Shrout and Bolger 2002, for an up-to-date review of mediation testing procedures, see Schneider et al 2005, pp 1022–1026)

In the first step, we tested the relationship between the predictors (employee characteristics) and the mediator (CNK) In the second step, we tested for the relationship between the mediator and the customer outcomes In addition, we tested (1) whether there is a significant increase in model fit if CNK is added to a predictor–outcome model and (2) whether there is no such increase if the employee predictors are added to a mediator–outcome model

In contrast to Baron and Kenny's (1986) traditional mediation testing approach, a significant relationship between the predictor and the outcome variables is not considered a necessary condition for mediation in the recent statistical literature (e g , James, Mulaik, and Brett 2006, Kenny, Kashy, and Bolger 1998, Shrout and Bolger 2002) As Schneider and colleagues (2005, p 1023) summarize, "If full mediation is hypothesized, then a direct relationship between the initial variable and the outcome variable is not expected, and so it is only necessary to show that the path between the mediator and the outcome is significant If complete mediation is hypothesized, then a model should be tested with a path from the initial variable to the mediator and a path from the mediator to the outcome variable, but not with one from the initial variable to the outcome variable" That is, if there is a significant relationship between the predictor and the mediator and between the mediator and the outcome and if the predictor does not explain any additional variance of the outcome (beyond the mediator), full mediation is indicated (see Schneider et al 2005, p 1025)

To test for the significance of the indirect effect of employee variables on customer outcomes through CNK (Shrout and Bolger 2002), we used bootstrapping methods, relying on Hayes's (2005) SPSS macro The bootstrapping method is similar to the Sobel (1982) test but is suggested as a superior alternative if raw data are available (Preacher and Leonardelli 2007) We estimated the indirect effect of the predictors through the mediator variable on the dependent variables and repeated the resampling 5000 times

Detailed results of our mediation analyses appear in Table 5 These results reveal that CNK fully mediates between the employee variables and customer outcomes In all cases, we find significant effects of the predictors (customer orientation and cognitive empathy) on the mediator (CNK) and of the mediator on the customer outcomes (customer satisfaction and willingness to pay) Moreover, bootstrapping results provide evidence for the significance of the indirect effects We also find a significant increase in model fit when CNK is added to a predictor–outcome model, though there is no such increase if the employee predictors are added to the mediator–outcome models Therefore, in summary, we find strong evidence for full mediation in our analyses, which yields support for H_{10} and H_{11}

The correlation matrix (see Table 2) shows that there are no significant direct effects of the employee variables on the customer outcomes (except for an effect of customer orientation on willingness to pay in Study 1) This is in accordance with our argument for an indirect effect because we find significant effects in the chain of employee variables, CNK, and customer outcomes as well as significant indirect effects

Robustness Checks and Additional Analyses

Longitudinal analyses To strengthen the proposed causal relationship between the employee variables and CNK, we conducted a cross-lagged analysis (Joreskog 1979), using the matched data of 90 employees and their customers from Studies 1 and 2[2] In line with the direction of our hypotheses, employee customer orientation and cognitive empathy at t_1 are significantly related to CNK at t_2 (for customer orientation $\beta = 19$, $p < 05$, for cognitive empathy $\beta = 18$, $p < 05$), whereas the opposite path, in which CNK at t_1 influences employee customer orientation and cognitive empathy at t_2, is not significant (for customer orientation $\beta = 02$, n s , for cognitive empathy $\beta = 01$, n s) These results strengthen the empirical support for H_1 and H_3 and the internal validity of our study We also examined how customer orientation and cognitive empathy are related over time—an issue that has not been addressed in previous research The findings of the cross-lagged analyses suggest that there is no causal dominance of one of the constructs

Validation of the CNK measure We validated our CNK measurement approach in several ways First, in Study 2, we tested the psychometric quality of our ranking order approach by validating it with a scale format in which both customers and employees rated the importance of each need on a seven-point scale Analyzing both types of difference scores, we find (1) that there is a high correlation between rating and ranking differences (r = 76), (2) that the rating differences display a sufficient scale reliability across the six needs, and (3) that all key findings remain stable with both CNK measures

Second, in Study 2, we validated our CNK measure, which is based on shopping needs, with a CNK measure that is based on vacation and destination needs We conducted several analyses to compare the role of CNK with respect to both need categories Again, these analyses yield a high correlation between both CNKs (r = 75) and largely confirm our findings regarding predictors and outcomes of CNK This demonstrates the stability of CNK across major customer need categories

Third, we conducted several analyses to account for potential problems related to difference scores For example, Peter, Churchill, and Brown (1993, p 658) note that an issue that might lead to reliability problems is that "the components of difference scores can often be expected to be positively correlated" Therefore, we tested for such correlations and, in general, find low effect sizes The average correlations between the six need rankings are 19 in Study 1 and 10 in Study 2 For the rating scores in Study 2, the average correlation is 29

We also assessed discriminant validity by using the criterion that Fornell and Larcker (1981) propose for all CNK components with all framework constructs In all cases, the average variance extracted exceeds the squared correlations between the pairs of constructs Moreover, we find an average correlation between the six need rankings and the CNK difference score of 16 in Study 1 and 12 in Study 2 For the rating scores in Study 2, the average correlation with the CNK difference score is 14 These findings indicate that there are no severe problems regarding the discrimination of the CNK difference score from at least one of its components (Peter, Churchill, and Brown 1993)

Finally, variance restrictions may be a problematic issue related to difference scores—particularly when one of the components used in calculating a difference score is consistently higher than the other (Peter, Churchill, and Brown 1993) As Table 1 shows, we observe a reasonable variance for our CNK construct in both studies (Study 1 M = 7 4, SD = 3 4, Study 2 M = 8 5, SD = 3 1) In addition, we conducted paired t-tests to determine whether one of the components is consistently higher than the other Of the six needs in Study 1, we find that two are rated higher by customers and two others are rated higher by employees, the remaining needs were rated equally high Study 2 yields an analogous finding

Social desirability bias Manager ratings may potentially suffer from a social desirability bias We undertook two steps to test for the existence of such a bias First, we were able to validate manager self-ratings of their general leadership styles (e g , charismatic leadership, respect for employees) with the ratings of the employees' perceptions of the respective leadership styles Arguably, self-ratings of such leadership styles can suffer from a social desirability bias, as indicated in the leadership literature (e g , Dvir et al 2002) In our data, we find high correlations between manager and employee ratings in terms of charismatic leadership style (r = 72, measured with eight items from

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[2] To match the data at the employee level, we aggregated the CNK data We justified this on the basis of a sufficient within-group agreement of $r_{wg} = 76$ in Study 1 and $r_{wg} = 75$ in Study 2, which is in line with the recommended norms in group-level research (Bliese 2000)

TABLE 5
Results of Mediation Analyses

Predictor (X)	Mediator (M)	Outcome (Y)		X → M	M → Y	Increase in Model Fit When M Is Added to the Model. X → Y	Increase in Model Fit When X Is Added to the Model: M → Y	Significance of Bootstrapping for Indirect Effects
Customer orientation	CNK	Customer satisfaction	Study 1	t = 3 27**	t = 2 87**	$\Delta\chi^2$ = 8 34 (d f = 1)**	$\Delta\chi^2$ = 14 (d f = 1)	p < 01
			Study 2	t = 3 41**	t = 3 74**	$\Delta\chi^2$ = 12 20 (d f = 1)**	$\Delta\chi^2$ = 51 (d f = 1)	p < 01
Cognitive empathy	CNK	Customer satisfaction	Study 1	t = 2 63**	t = 2 87**	$\Delta\chi^2$ = 8 02 (d f = 1)**	$\Delta\chi^2$ = 01 (d f = 1)	p < 01
			Study 2	t = 2 34**	t = 3 74**	$\Delta\chi^2$ = 12 33 (d f = 1)**	$\Delta\chi^2$ = 25 (d f = 1)	p < 01
Customer orientation	CNK	Willingness to pay	Study 1	t = 3 27**	t = 2 32**	$\Delta\chi^2$ = 4 13 (d f = 1)*	$\Delta\chi^2$ = 2 79 (d f = 1)	p < 05
			Study 2	t = 3 41**	t = 4 29**	$\Delta\chi^2$ = 20 14 (d f = 1)**	$\Delta\chi^2$ = 2 92 (d f = 1)	p < 01
Cognitive empathy	CNK	Willingness to pay	Study 1	t = 2 63**	t = 2 32**	$\Delta\chi^2$ = 3 86 (d f = 1)*	$\Delta\chi^2$ = 3 79 (d f = 1)	p < 05
			Study 2	t = 2 34**	t = 4 29**	$\Delta\chi^2$ = 17 93 (d f = 1)**	$\Delta\chi^2$ = 22 (d f = 1)	p < 01

*p < 05 (one-tailed)
**p < 01 (one-tailed)

Conger, Kanungo, and Menon [2000]) and respect for employees (r = 78, measured with four items adapted from Tyler and Blader [2001]) Second, the employees indicated whether they took part in perspective-taking training programs of the travel agency We find a high correlation of this indication with the manager scores on perspective-taking training (Study 1 68, Study 2 71) These findings show that social desirability is not an issue in our study, even though we were not able to include a direct measure of social desirability

Discussion

Research Issues

Although the identification of customer needs is considered a cornerstone of the marketing concept (Kohli and Jaworski 1990), the accuracy of frontline employees' perceptions of customer needs has never been examined in a systematic manner Following the pragmatic approach to perceptual accuracy (Fiske 1993, Gill and Swann 2004), our study introduces the concept of CNK, which describes the extent to which a frontline employee can accurately identify a given customer's hierarchy of needs

On the basis of a multilevel investigation involving data from three different levels (customers, employees, and managers), we provide evidence for the often-stated but never empirically analyzed postulation that a high degree of customer orientation is associated with superior knowledge of customer needs (Goff et al 1997) Thus, our research follows calls to go beyond the extent to which companies engage in market-oriented processes and to examine the quality of such processes (Jaworski and Kohli 1996) Because the determination of customer needs is a central aspect of customer orientation (Saxe and Weitz 1982), the concept of CNK constitutes an adequate measure for the quality of employees' customer-oriented behaviors However, these behaviors do not necessarily translate into high levels of CNK if employees lack the required skills (Pettijohn, Pettijohn, and Taylor 2002) Our results show that providing training for customer-oriented interaction behavior enhances the positive relationship between customer orientation and CNK

In a similar vein, it has been stated that employees' empathic ability should facilitate the accurate perception of customer needs (Von Bergen and Shealy 1982) However, most empirical research in marketing directly links employees' empathy to performance outcomes, leading to mixed results (Dawson, Soper, and Pettijohn 1992, Pilling and Eroglu 1994) In our research, we link empathy to CNK, a construct that is conceptually closer than performance outcomes As hypothesized and in line with research in social psychology (Bernstein and Davis 1982), we find strong evidence for an effect of cognitive empathy on CNK However, against our expectation, perspective-taking training (i e , role-playing) does not enhance the effect of cognitive empathy on CNK Although previous experimental research in developmental psychology has demonstrated that perspective-taking training stabilized the effects of participants' empathic ability, this research was conducted with adolescents (Marsh, Serafica, and Barenboim 1980) Employees' level of empathy might already be stable at a certain level and, thus, unreceptive toward perspective-taking training

Furthermore, we demonstrate that relational aspects of the employee–customer dyad constitute important antecedents of CNK Specifically, our results reveal that CNK increases with the length of the relationship, providing evidence for an acquaintance effect (Blackman and Funder 1998) This finding also contributes to research in the field of relationship marketing, which proposes that ongoing relationships are beneficial for customers and companies (Bolton 1998, Reynolds and Beatty 1999) For example, on the basis of the results of qualitative interviews, Gwinner, Gremler, and Bitner (1998) argue that customers should accrue customization benefits from long-term relationships One illustrative customer comment the authors cite states the following "They can anticipate my needs Having a history with them means they should not have to continue asking you questions about your requirements and what it is you want They should have knowledge of you" (p 107) To our knowledge, ours is the first study to provide empirical evidence for the impact of relationship length on employees' knowledge of customer needs

Another relational aspect assumed to be linked to sales performance is the similarity of employees and their customers (Davis and Silk 1972, Evans 1963) However, the lack of a sound theoretical basis for such a relationship and mixed empirical findings prevented the derivation of clear implications (Weitz 1978) Drawing on the social cognition literature, we argue that dissimilarity between employees and their customers regarding salient cues, such as age and gender, should lead to lower levels of perceptual accuracy (i e , lower levels of CNK) Theoretically, this can be explained by the out-group homogeneity effect (Fiske 1993)

Whereas the results of our study provide support for a negative effect of age discrepancy on CNK, no such effect emerged for gender discrepancy Though unexpected at first glance, this result provides indirect support for an out-group homogeneity effect in the interaction between employees and customers Empirical findings on categorization and stereotyping have shown that "when not asked specifically about gender-linked characteristics, people categorize others most readily on the basis of their age" (Kite, Deaux, and Miele 1991, p 24) Thus, the negative impact of age discrepancy on perceptual accuracy provides an indication for underlying categorization processes that constitute the basis for out-group homogeneity effects

The goal of the interaction between frontline employees and customers is the satisfaction of customer needs and the provision of customer value (Day 1994) According to the pragmatic approach to accuracy, the availability of accurate, goal-relevant knowledge constitutes an important prerequisite for the attainment of interaction goals (Gill and Swann 2004) Although the marketing literature assumes that accurate knowledge of customer needs leads to higher levels of customer satisfaction and willingness to pay (Bettencourt and Gwinner 1996, Grewal and Sharma 1991, Ravald and Gronroos 1996), this relationship has never been tested empirically. The results of our study reveal that high levels of CNK are indeed associated with higher levels of customer satisfaction and willingness to pay.

Moreover, we show that CNK fully mediates the influence of employees' customer orientation and cognitive empathy on these two customer outcomes. This finding constitutes an important contribution to the literature on customer orientation and empathy. Whereas previous research on the direct impact of customer orientation and empathy on customer outcomes provides mixed evidence (e.g., Aggarwal et al. 2005; Franke and Park 2006), our results imply that the influence of these two employee characteristics on customer outcomes can be explained by one common factor: the proper identification of a given customer's hierarchy of needs.

Limitations and Further Research

This study exhibits several limitations that provide potential avenues for further research. First, the collection of a large amount of data on several levels was only possible by working closely with one company. However, this might have affected some of our findings. For example, the nonsignificant effect of perspective-taking training could be due to a lack of variation regarding this kind of training in a single company. Alternatively, it might be that in this company, perspective-taking training is often accompanied by training in customer-oriented interaction behavior, which might inhibit the detection of a separate effect of perspective-taking training. Thus, although the structure of the company we worked with is characteristic for industries with close frontline employee–customer interactions, further research should examine the cross-industry stability of our findings.

Second, in line with perceptual accuracy research (Bernstein and Davis 1982), we find that the cognitive ability to understand other people's thoughts and feelings positively influences CNK. Conversely, emotional aspects of empathy, such as empathic concern and emotional contagion, do not have any impact on the generation of CNK. However, these emotional aspects might constitute antecedents of other constructs that are relevant for successful employee–customer interactions. For example, Coke, Batson, and McDavis (1978) suggest that empathic emotion increases the motivation to help solve other people's problems. Therefore, further research could examine the impact of cognitive and emotional empathy on additional intermediate constructs, thus enhancing the understanding of the relationship between empathy and customer outcomes.

Third, this research provides a theoretical rationale for similarity effects in employee–customer interactions that is based on the out-group homogeneity effect discussed in the social cognition literature (Fiske 1993; Judd, Ryan, and Park 1991). Although we find support for similarity effects based on age as a salient categorization cue (Kite, Deaux, and Miele 1991), there might be other characteristics that trigger such effects. The identification of additional cues would enable an optimal matching of the employee–customer dyad. Experimental studies might be especially suited to examine such dyad heterogeneity effects.

Managerial Implications

Having demonstrated the importance of CNK for the provision of customer satisfaction and customer value, the question arises how companies can manage the generation of CNK. The employee characteristics and relational aspects identified as antecedents of CNK constitute a first step toward answering this question. In what follows, we elaborate on the respective implications for the selection, training, and assignment of frontline employees.

With regard to employee characteristics, our study demonstrates that customer-oriented frontline employees are more likely to determine the needs of individual customers. Moreover, the effect of customer orientation on CNK can be enhanced by providing training in negotiation skills that are necessary for the identification of customer needs. Such training programs are most effective when employees already exhibit a certain level of customer orientation. Our results also show that employees with a high degree of empathic understanding have more accurate perceptions of customer needs. Contrary to our expectation, however, the provision of perspective-taking training does not enhance the relationship between employees' empathic ability and CNK.

These findings highlight the notion that management of frontline employees' CNK should begin with recruiting and selecting. Specifically, managers should actively screen job candidates with regard to their degree of customer orientation and empathic abilities (Aggarwal et al. 2005). Moreover, training frontline employees in customer-oriented interaction behavior provides them with the necessary skills to practice customer-oriented behaviors. The finding that such training is most effective for highly customer-oriented employees again highlights the importance of using customer orientation as an employee selection criterion.

To ensure the effectiveness of training programs, managers should monitor subsequent changes in employees' CNK. For example, Verma, Thompson, and Louviere (1999) describe a tool based on a multinominal logit model that can be used to train and monitor sales employees' understanding of their customers' hierarchy of needs.

With regard to relational aspects, our study identifies the length of the relationship between an employee and a particular customer and the similarity between both as factors that increase employees' CNK. These findings have concrete implications for people placement. First, companies benefit from a permanent and clear assignment of frontline employees to individual customers. Keeping employees with customers for longer periods facilitates the accurate identification of customer needs and thus enables the realization of customization benefits (Gwinner, Gremler, and Bitner 1998). However, this requires that the respective employee is available when his or her customer demands a service. Scheduling software, which matches customers' online appointment requests with the availability of certain employees, might be useful in this context.[3]

A second implication for the assignment of frontline employees arises from the relationship between the similarity of the employee–customer dyad and CNK Davis and Silk (1972, p 68) note that "knowledge of what dimensions of similarity and differences are critical in a particular type of selling might lead to improved matchings" Our study reveals that employees who exhibit a large age discrepancy in relation to the customer they serve are less likely to discern the customer's needs This implies that companies should try to match the frontline employee–customer dyad with regard to age In initial contact situations, this can be done by providing a host who guides customers to employees who are similar to them or by instructing employees to turn over the lead to another employee when a prospect is dissimilar to themselves (Davis and Silk 1972)

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[3] We thank an anonymous reviewer for this suggestion.

Appendix
Scale Items for Construct Measures

CNK (Employees and Customers)

Customers We are interested in how far the following factors are comparably the most important for you with respect to travel booking

Employees Please consider the last customer interaction Which factors do you think are the most important for this customer with respect to travel booking?

Customers and Employees Please rank the factors by allocating rank "1" for the most important factor, rank "2" for the second most important factor, and so forth

- Convenience (e g , to have the least possible effort)
- Price (e g , to book travels with the best prices)
- Service (e g , the intensive consulting service by a travel agent)
- Brand (e g , to book brands of well-known travel companies)
- Security (e g , to have the security that the booked travel meets the expectations)
- Shopping enjoyment (e g , to have a travel planning that is fun and raises pleasant anticipation)

Customer Orientation (Employees) (Thomas, Soutar, and Ryan 2001): seven-point scale ranging from "totally disagree" to "totally agree"

1 I try to figure out what a customer's needs are
2 I have the customer's best interests in mind
3 I take a problem-solving approach in selling products or services to customers
4 I recommend products or services that are best suited to solving problems
5 I try to find out which kinds of products or services would be most helpful to customers

Cognitive Empathy (Employees) (Barrett-Lennard 1981): seven-point scale ranging from "totally disagree" to "totally agree"

1 I always sense exactly what customers want
2 I realize what customers mean even when they have difficulty in saying it
3 It is easy for me to take the customer's perspective

Empathy Perspective Taking (McBane 1995) seven-point scale ranging from "totally disagree" to "totally agree"

1 I try to look at everybody's side of disagreement before I make a decision
2 When I'm upset at someone, I usually try to "put myself in their shoes"
3 I believe that there are two sides to every question and try to look at them both

Empathy Empathic Concern (McBane 1995) seven-point scale ranging from "totally disagree" to "totally agree"

1 I would describe myself as a pretty soft-hearted person
2 If someone is unhappy, I quickly realize this, even if I don't know the person well
3 Other people's misfortunes usually disturb me a great deal
4 I often have tender, concerned feelings for people less fortunate than me

Empathy Emotional Contagion (McBane 1995) seven-point scale ranging from "totally disagree" to "totally agree"

1 I become nervous if others around me are nervous
2 I can't remain cool if others around me are excited
3 I get easily infected by the mood of others
4 If I see unhappy people, I feel unhappy myself
5 If I see happy people, I feel happy myself

Acquaintance (Employees and Customers) (Bell, Auh, and Smalley 2004)

1 Length of the specific relationship between an employee and a customer

Age Discrepancy Between Employee and Customer (Employees and Customers)

1 Absolute difference between employee and customer age

Gender Discrepancy Between Employee and Customer (Employees and Customers)

1 Absolute difference between employee and customer gender (dummy variable)

Training of Customer-Oriented Interaction Behavior (Managers) (Liu and Comer 2007): seven-point scale ranging from "totally disagree" to "totally agree"

1 My employees are thoroughly trained in customer-oriented negotiation aimed at discerning customer needs
2 My employees are thoroughly trained in sales-oriented negotiation aimed at closing a sale (reverse coded)
3 I regularly give hints and advice to my employees regarding customer-oriented negotiation

Perspective-Taking Training (Managers): seven-point scale ranging from "totally disagree" to "totally agree"

1 My employees participate in role-playing where they take the customer position

Customer Satisfaction (Customers) (Bettencourt 1997): seven-point scale ranging from "totally disagree" to "totally agree"

1 All in all I am very satisfied with the visit in this travel agency
2 The visit in this travel agency meets my expectations of an ideal visit in a travel agency
3 The visit has fulfilled my expectations

Customer Willingness to Pay (Customers) (Homburg, Koschate, and Hoyer 2005)

1 "Imagine you would have booked a last minute travel to Mallorca for two persons after a consulting service in this travel agency The duration of the travel is 1 week and includes half-board in a 3-star hotel The price is 300 euros per person—that is, 600 euros in total What is the maximum price you are willing to pay for the travel agency service?" 0 euros, 6 euros, 12 euros, 18 euros, 24 euros, 30 euros, 36 euros, 42 euros, 48 euros, 54 euros, 60 euros, 66 euros, 72 euros, 78 euros, 84 euros, 90 euros, 96 euros, 102 euros, 108 euros
2 "Imagine you would have booked a travel to Gran Canaria for two persons after a consulting service in this travel agency The duration of the travel is 2 weeks and includes half-board in a 4-star hotel The price is 1000 euros per person—that is, 2000 euros in total What is the maximum price you are willing to pay for the travel agency service?" 0 euros, 20 euros, 40 euros, 60 euros, 80 euros, 100 euros, 120 euros, 140 euros, 160 euros, 180 euros, 200 euros, 220 euros, 240 euros, 260 euros, 280 euros, 300 euros, 320 euros, 340 euros, 360 euros
3 "Imagine you would have booked a return flight from Frankfurt to Rome with Lufthansa after a consulting service in this travel agency The price is 300 euros (including tax and airport charge) What is the maximum price you are willing to pay for the travel agency service?" 0 euros, 3 euros, 6 euros, 9 euros, 12 euros, 15 euros, 18 euros, 21 euros, 24 euros, 27 euros, 30 euros, 33 euros, 36 euros, 39 euros, 42 euros, 45 euros, 48 euros, 51 euros, 54 euros
4 "Imagine you would have booked a return flight from Frankfurt to Los Angeles after a consulting service in this travel agency The price is 1000 euros (including tax and airport charge) What is the maximum price you are willing to pay for the travel agency service?" 0 euros, 10 euros, 20 euros, 30 euros, 40 euros, 50 euros, 60 euros, 70 euros, 80 euros, 90 euros, 100 euros, 110 euros, 120 euros, 130 euros, 140 euros, 150 euros, 160 euros, 170 euros, 180 euros

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Valentyna Melnyk, Stijn M.J. van Osselaer, & Tammo H.A. Bijmolt

Are Women More Loyal Customers Than Men? Gender Differences in Loyalty to Firms and Individual Service Providers

Prevailing wisdom assumes that female consumers are more loyal than male consumers The authors report conditions under which the reverse is found, depending on the object of customer loyalty For example, whereas female consumers tend to be more loyal than male consumers to individuals, such as individual service providers, this difference is reversed when the object of loyalty is a group of people The authors find a similar crossover interaction effect for loyalty to individual employees versus loyalty to companies This effect is mediated by self-construal in terms of relational versus collective interdependence The authors discuss the managerial and theoretical implications of these gender differences

Keywords customer loyalty, gender, self-construal, loyalty to company, loyalty to employee

Customer loyalty has been the object of intense interest in both the business and the academic worlds (Oliver 1999, Reichheld 2001) The concept of customer loyalty is at the heart of customer relationship management (Rust, Zeithaml, and Lemon 2002) and is the raison d'être of omnipresent loyalty programs (Kivetz and Simonson 2002, 2003, Van Heerde and Bijmolt 2005, Yuping and Yang 2009) At the same time, academic research has discovered important differences in cognitive processes and behavior between male and female consumers (Fisher and Dubé 2005, Meyers-Levy 1988, 1989, Meyers-Levy and Maheswaran 1991, Meyers-Levy and Sternthal 1991) These differences are reflected in the widespread use of gender as a segmentation variable in marketing practice

Despite the importance of customer loyalty on the one hand and gender differences on the other hand, little is known about the existence and nature of gender differences in customer loyalty This is surprising because if male and female loyalties differ, men and women might require a different selling approach, have different levels of customer value, and respond differently to loyalty programs and other actions aimed at enhancing customer loyalty

Common stereotypes, perhaps based on widely publicized findings showing that men exhibit lower levels of sexual loyalty than women (e g , Blumstein and Schwartz 1983, Hansen 1987), suggest that women are more loyal customers than men We conduct five studies that show the reverse effect, depending on the type of loyalty object Whereas female customers are relatively more loyal to individuals, such as individual service providers, male customers are relatively more loyal to groups and grouplike entities, such as companies The latter effect is counterintuitive in light of theories arguing that women are more interdependent than men (e g , Cross and Madson 1997b) We explain this counterintuitive effect by showing that the gender differences in customer loyalty are mediated by female versus male self-construal in terms of relational versus collective interdependence We discuss implications for marketing and gender identity theory

Theoretical Background

Loyalty

Loyalty has many different forms—for example, loyalty to a significant other, a family, an employer, or a country (patriotism) but also to a service provider, a store, or a brand Loyalty also has many definitions (e g , Fournier 1998, Jacoby and Chestnut 1978, Oliver 1999, Pritchard, Havitz, and Howard 1999, Reichheld 2003, Sirgy and Samli 1985) Despite substantial disagreement about the exact definition or nature of the loyalty concept, common elements among many of the loyalty definitions are that there is a relationship of some sort (i e , ranging from very shallow to very strong) between an actor and another entity and that the actor displays behavioral or psychological allegiance to that entity in the presence of alternative entities We believe that this is the core of the loyalty concept Departing from this core concept, we have chosen several different measures of loyalty that reflect the measures, indi-

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cators, and definitions found in the literature We are confident that across the five studies, this multimethod approach gets at the most important aspects of the loyalty concept

Over the years, researchers have investigated many antecedents of customer loyalty to stores, companies, and brands (see Dick and Basu 1994, Johnson, Herrmann, and Huber 2006, Oliver 1999) Other researchers have documented the nature of loyalty relationships (Aggarwal 2004, Fournier 1998, Muñiz and O'Guinn 2001) Despite the popularity of consumer loyalty as a research topic, we are not aware of any systematic investigation of the role of gender in consumer loyalty Therefore, we rely on more general theories regarding gender differences

Interdependence Versus Independence

Consistent with common stereotypes, a popular agency perspective of the fundamental differences between men and women in Western cultures may be taken to suggest that men are less loyal than women Summarizing this perspective, Cross and Madson (1997b) argue that women, more than men, view themselves as interdependent (Markus and Kitayama 1991) They strive to feel connected to other people Interrelatedness with society, social relationships, and social groups is a more important part of their identity than it is for men Women focus on maintaining relationships In contrast, as this theory argues, men in Western cultures view themselves as more independent, are more individualistic, and strive for uniqueness and individuality For men more than women, the concerns of society, family members, or other people are secondary to those of the individual According to Cross and Madson (1997b), these differences in self-construal are the result of differences in socialization for men and women beginning in early childhood

Scattered findings in the marketing literature seem to support this view For example, Meyers-Levy (1988) finds that in a taste test, women were more influenced by the opinion of another person than men were The results from this experiment were interpreted in terms of men being self-focused and women being focused on both self and others

Relational Versus Collective Interdependence

In a conceptual article, Baumeister and Sommer (1997) critique the distinction between a female focus on interdependence and a male focus on independence Citing a fundamental human need to belong (Baumeister and Leary 1995), Baumeister and Sommer (1997) propose that Western men and women are equally interdependent, the difference being that women tend to focus more on establishing and maintaining a small number of close relationships with specific individuals (relational interdependence) whereas men tend to focus more on establishing and maintaining relationships with more abstract and larger groupings of people (collective interdependence) They argue that many findings that fit the interdependence versus independence view of female and male self-construal are equally consistent with the relational interdependence versus collective interdependence view

Baumeister and Sommer's (1997) theory remains largely untested empirically, but it is consistent with the work of Gabriel and Gardner (1999), who find, for example, that when asked to describe an emotional experience, women were more likely to describe a relational experience, whereas men were more likely to mention a collective experience Baumeister and Sommer's theory also seems consistent with recent evidence for the "male-warrior hypothesis" (Van Vugt, De Cremer, and Janssen 2007), which posits that a male group orientation has been shaped by evolution to increase a tribe's chances of survival

Gender Differences in Consumer Loyalty

Neither Cross and Madson's (1997b) nor Baumeister and Sommer's (1997) theory about male versus female self-construal speak directly to loyalty However, they can be used to inspire different predictions about customer loyalty A fundamental difference between men and women in terms of their self-construal as being independent versus interdependent may suggest that Western women are more likely than Western men to be loyal customers If women tend to strive more to establish and maintain relationships with people and social contexts, they may do the same for relationships with, for example, service personnel and companies Thus, the interdependence versus independence theory can be taken to suggest that women tend to be more loyal than men both to individuals (e g , individual service providers) and to groups or organizations (e g , companies) In contrast, the view of male and female self-construal as being characterized by relational versus collective interdependence may have different implications for consumer loyalty The idea that women tend to focus more narrowly on dyadic bonds and that men tend to focus more on a broader social structure suggests a qualification of the hypothesis that women are more loyal customers than men It suggests that female consumers are more loyal than male consumers to individuals but that the opposite effect occurs when the object of loyalty is a group In turn, this may imply that women are more loyal to individual employees but that men are more likely to be loyal to companies, which may be construed as a more grouplike phenomenon Finally, these implications lead to the prediction that in direct trade-offs between being loyal to a company or store and being loyal to an individual employee of that company or store, women are more likely than men to be loyal to the individual over the company or store

Note that even if Baumeister and Sommer's (1997) theory is correct at the level of general self-construal and at the level of loyalty to individuals versus groups in the personal social sphere, the theory's relevance to customer loyalty is far from assured In Baumeister and Sommer's theory, collective and relational interdependence are always characterized by a combination of the individual versus group nature and the close versus more distant nature of the relationships Most consumer relationships (for exceptions, see Fournier 1998, Muñiz and Schau 2005) are much shallower than the close individual relationships Baumeister and Sommer discuss Thus, to the extent that the main difference between male and female self-construal is in the closeness of female versus male relationships, our loyalty prediction may be confirmed in general but not in the consumer realm Nevertheless, some evidence suggests that the individual versus group factor per se is sufficient to assert gender differences. Recent findings show that even human male infants tend to be more attentive to displays showing a group of unfamiliar puppets, whereas female infants tend to attend more to displays of a single unfamiliar puppet (Benenson, Duggan, and Markovits 2004). These findings imply that even in relatively shallow consumer relationships, female consumers may be more loyal than male consumers to individuals than to groups. Study 1 tests the hypothesis that female consumers are more loyal to individuals whereas male consumers are more loyal to groups.

Study 1

We designed Study 1 to assess gender differences in consumer loyalty to individuals and groups. Common stereotypes and the popular theory of female versus male self-construal as more interdependent versus independent suggest that women are more loyal than men to both individuals and groups. In contrast, the theory of female versus male self-construal as more relationally interdependent versus collectively interdependent suggests that this effect should be found only for loyalty to individuals, whereas the opposite effect should be found for loyalty to groups. In Study 1, we measure loyalty by asking participants to rate how likely they would be to buy (i.e., a display of allegiance) from a store owned by one or a group of acquaintances (i.e., entity or entities with whom the actor has a relationship) versus another store that was located closer in proximity (i.e., an alternative).

Method

Seventy-five female and 89 male undergraduate students at a Dutch university participated for a €7 fee. Participants were randomly assigned to the individual or group condition. Participants in the individual condition were asked to read the following scenario:

> Imagine the following situation. The company where you work plans a Christmas celebration. You have volunteered to go buy the Christmas cake for the celebration during your lunch break (the company pays for the cake). The closest bakery is within a 5-minute walk from the company. However, you know that somebody you went to high school with, but never had much contact with during or after your high school days, owns and runs a bakery store, which is on the other side of town (about 30 minutes by bike). At this moment it is raining outside. You also know that your former classmate cannot know that you need to buy a cake, thus, if you buy it in the closest bakery s/he will not find out about that. The quality of the cakes is the same in both stores.

Participants in the group condition read the same scenario, with the exceptions that "somebody" was replaced with "a group of people," "classmate" was replaced with "classmates," and "s/he" was replaced with "they." Participants then indicated their choice on a seven-point scale where 1 indicated that the participant would definitely buy the cake at the closest bakery, 7 indicated that the participant would definitely buy the cake at the classmate's or classmates' bakery, and 4 indicated indifference. Because consumer relationships are often on the less close side of the spectrum and because individual and group relationships may differ in closeness, it is important to determine whether the individual versus group nature of a loyalty object per se can drive gender differences. We controlled for closeness by keeping it low in the scenario for both the individual and the group conditions and by measuring it as a covariate. Thus, to control for level of relationship closeness, we also asked participants to answer the following question: "How close is your relationship with your former classmate(s)?" (1 = "not at all close," and 7 = "very close"). We counterbalanced the order of this measure and the buying intention measure. The effect of interest (i.e., the interaction between gender and individual versus group) did not interact with relationship closeness, order, or their interaction (all $ps > .10$; all p-values in this article are two-tailed).[1] Thus, we do not consider relationship closeness and order any further. Finally, participants indicated their gender and were debriefed.

Results

An analysis of variance with likelihood of store choice as the dependent variable and individual versus group, gender, and their interaction as independent variables yielded the predicted effect. There was a significant crossover interaction between gender and individual versus group ($F(1, 160) = 10.38$, $p < .01$), showing that male participants reported that they would be more likely to choose the far-away bakery if it was run by a group of acquaintances ($M_{\text{female-group}} = 1.68$, $M_{\text{male-group}} = 2.41$, $t(65) = -2.13$, $p < .05$), whereas female participants indicated a higher likelihood to choose the far-away bakery if it was run by an individual acquaintance ($M_{\text{female-individual}} = 2.66$, $M_{\text{male-individual}} = 1.71$, $t(60) = 2.44$, $p < .05$). The results showed no main effect of gender ($F(1, 160) = .17$, $p > .10$), indicating that female participants did not express a stronger preference for the far-away bakery than male participants across both the individual and the group conditions. There was also no significant main effect of the individual versus group factor ($F(1, 160) = .30$, $p > .10$).

Discussion

The results in Study 1 support the prediction that women are more loyal than men when the object of loyalty is an individual. When the object of loyalty is a group, we observe the opposite effect. At least three criticisms can be brought against Study 1. First, although we designed Study 1 to maximize internal validity, it may be criticized for involving a hypothetical scenario instead of assessing the loyalties consumers hold in reality. Second, given the many definitions of loyalty in the marketing literature, it might be argued that we did not use the right measure of loyalty. For example, buying intentions in Study 1 may have reflected a male (female) preference to socialize with groups (individuals), independent of any psychological loyalty. Third, because consumer relationships often involve individuals, such as individual service providers (e.g., day care provider, hairdresser), it might seem that consumers deal with groups much less often. Although it is theoretically important to show a mere group versus individual effect and though consumers sometimes interact with groups of day care providers or hairdressers, the practical significance of consumer loyalty findings involving groups may be questioned. However, consumers regularly interact and develop relationships with organizations or companies (e.g., stores, chains of stores) that tend to involve groups of people. In addition, ample evidence from the literature on minimal groups suggests that people can feel collective interdependence with groups that are much less central to their daily lives than work groups, groups of friends, or strong social structures, such as tribes (Tajfel et al. 1971). Thus, it is possible that the pattern of loyalty to individuals versus groups extends to individuals versus organizations or companies as well. We designed Study 2 to address these three points.

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[1] We found a significant main effect of closeness ($F(1, 148) = 12.21$, $p < .01$), with a closer perceived relationship being associated with a higher perceived likelihood to choose the more distant bakery. However, this effect was not dependent on gender ($F(1, 148) = 1.12$, $p > .10$). Because we designed the scenario to keep variance in closeness at a minimum and did not manipulate closeness, this null effect should not be overinterpreted. Women and men did not differ significantly in their perceptions of closeness in either the group ($t(79) = 1.60$, $p > .10$) or the individual ($t(81) = -.40$, $p > .10$) condition.

Study 2

Study 2 tests the hypothesis that men and women differ in the objects of their loyalty. That is, the objects of female loyalty are more likely to be individuals, whereas the objects of male loyalty are more likely to be groups. In Study 2, participants generated 20 statements that began with the words "I am loyal to ...." Thus, we (1) asked participants about their actual, real-world loyalties instead of a hypothetical scenario and (2) measured the concept of loyalty as the participants themselves defined and understood it. In addition, (3) we began to explore whether the individual versus group difference extends to individual employees/service providers or to companies/organizations by coding not just the individual versus group nature of participants' answers but also whether they involved individual employees or organizations.

Method

Participants were 19 female and 19 male graduate students at a Dutch university who volunteered to participate for extra course credit. By means of an adaptation of the Twenty Statements Test (Gabriel and Gardner 1999; Kuhn and McPartland 1954), participants were asked to generate 20 statements that all begin with the words "I am loyal to ...." After all statements were elicited, participants indicated whether the object of loyalty in each of their statements was more like a person or more like a group. Thus, no mention was made of this binary rating task until all 20 statements were completed. As a result, the rating task did not influence the generation of the statements. Finally, participants were asked to indicate their gender, were debriefed, and were thanked for their participation.

In addition to the coding by the participants themselves, two independent coders, who were blind to the purpose of the experiment and to the gender of the participants, coded the objects of loyalty. They coded the statements as being about individuals or groups or neither (e.g., colors, animals). Statements coded as being about individuals were further coded as being about a person in personal relationships (e.g., "I am loyal to my boyfriend"), specific employees or service providers (e.g., "I am loyal to my hairdresser"), or other individuals (e.g., "I am loyal to my neighbor"). Similarly, groups were classified into groups of people (e.g., "I am loyal to my family"), companies or organizations (e.g., "I am loyal to my mobile phone company"), or communities (e.g., "I am loyal to my country"). The coders' independent classifications corresponded for 97% of the statements. Mismatches were resolved by discussion between the coders.

Results

We performed an analysis using the participants' classification of statements as being personlike versus grouplike. Because of the individual differences in the total number of loyalty objects participants generated (range = 16–20), we calculated the share of each category as a percentage of the total number of statements for each participant separately. The results (see Table 1) showed that loyalty objects perceived as more personlike (grouplike) made up a larger share of statements elicited from female (male) participants than from male (female) participants ($t(36) = 2.68$, $p < .05$).

Next, we analyzed the statements coded by the independent coders using a statistical approach similar to that of Gabriel and Gardner (1999). Of the statements coded as either group or individual (i.e., excluding statements categorized as neither group nor individual), individual (group) statements made up a larger proportion for women (men) than for men (women) ($t(36) = 3.36$, $p < .01$). Thus, the results from the self-classified and coder-classified statements both supported the hypothesis that the objects of female loyalty are more likely than the objects of male loyalty to be individuals, whereas the objects of male loyalty are more likely than the objects of female loyalty to be groups.

We also began exploring whether the individual versus group difference extends to individual employees/service providers or to organizations/companies. Of the loyalty objects coded as an individual or group, a larger percentage involved individual employees or service providers for female participants than for male participants ($t(36) = 2.47$, $p < .05$). In contrast, the percentage of companies or organizations was higher for male participants than for female participants ($t(36) = 2.31$, $p < .05$). Thus, the data in Study 2 support the hypothesis that male customer loyalty is focused more on companies (than individual employees or service providers) than female loyalty.

Our hypothesis about male and female loyalty to companies or organizations versus individual employees or service providers was based on the assumption that companies or organizations share some characteristics with groups. To test this assumption, we analyzed the statements coded by the independent coders as companies or organizations. We

TABLE 1
Results of Study 2

	Means			
	Female		Male	
Type of Loyalty Object	Count	Percentage	Count	Percentage
Objects perceived as more like a person by participants	10 16	55 93	7 53	38 68
Objects perceived as more like a group by participants	8 21	44 07	11 95	61 32
Objects coded as individuals by coders	3 16	29 47	1 42	14 14
Objects coded as groups by coders	7 63	70 53	9 68	85 86
Objects coded as employees/service providers by coders	1 27	10 59	22	1 55
Objects coded as companies/organizations by coders	3 37	28 87	5 11	44 76

Notes The differences in share levels between the results based on classification by participants and those based on classification by independent coders are because most statements classified as "neither" by the coders (e g , "my bicycle," "my dog") were classified as more personlike by the participants This led to a lower share of individual statements in the coder-classified analysis than in the participant-classified analysis

found that the participants perceived a large majority (78%) of those statements as more grouplike than personlike There was no significant gender difference in this perception (t(36) = –1 48, $p >$ 10)

Discussion

Study 2 provides additional support for the hypothesis that men and women differ in their loyalty to groups versus individuals, and it addresses several issues Study 1 could not address In addition, we find initial evidence that the loyalty difference with respect to groups versus individuals extends to companies or organizations versus individual employees or service providers However, Study 2 does not directly address an issue that is particularly important in marketing management—namely, consumers' direct trade-off between loyalty to an individual service provider and loyalty to an organization (Bendapudi and Leone 2002, Palmatier, Scheer, and Steenkamp 2007) For example, Bendapudi and Leone (2002) assess the problem of consumers choosing to be loyal either to a favored service employee or to the firm when the employee moves to another firm Even if an employee does not move, the balance of power between the employee and the firm, and thus the appropriability of the value created by the employee (Collis and Montgomery 1995, Wernerfelt 1984), is affected by loyalty to the employee versus the company In Study 3, we assess the difference between men and women in direct trade-offs between loyalty to individual service providers and loyalty to firms

Study 3

In Study 3, we test the hypothesis that in direct comparisons between individual service providers and the companies they work for, male consumers are more loyal to the companies (than to individual service providers) than female consumers This study uses multiple product categories, involves participants' actual consumer relationships, and employs both attitudinal and behavioral intention measures of loyalty

Method

Forty-one female and 39 male master's students at a Dutch university participated for extra course credit Participants were asked to indicate the extent to which they were loyal to an individual service provider versus a company in seven different categories The categories were (1) hairdresser versus hairdressing salon, (2) bike repairperson versus bike repair shop, (3) sports coach/trainer versus sports club, (4) travel agent versus travel agency, (5) bartender/waiter (waitress) versus bar/pub/café, (6) clothing salesperson versus clothing store, and (7) medical specialist versus hospital

For each category, participants were asked to answer four questions that assessed their loyalty to the actual, not imagined, person versus company before continuing to the next category First, participants indicated their attachment to the person versus the company For example, participants were asked, "Do you feel more attached to your favorite hairdresser (i e , the person) or to the hairdressing salon s/he works at (i e , the company)?" (1 = "definitely to the hairdresser," and 7 = "definitely to the hairdressing salon") Second, participants indicated their commitment to the person versus the company using the same seven-point scale ("Do you feel more committed ") Third, participants indicated their behavioral intention to follow the employee or stay with the firm should the employee leave the firm (e g , "If your favorite hairdresser would move to another hairdressing salon, would you follow him/her to that other salon or would you stay with your current salon", 1 = "definitely will follow the hairdresser," and 7 = "definitely will stay with the hairdressing salon") Fourth, participants were asked about word-of-mouth recommendation (e g , "If a friend of yours seeks advice about a haircut, would you rather recommend him/her your specific hairdresser [i e , the person] or your hairdressing salon in general [i e , the company]", 1 = "definitely will recommend the hairdresser," and 7 = "definitely will recommend the hairdressing salon") We designed the four questions—attachment (Pritchard, Havitz, and Howard 1999), commitment (Chaudhuri and Holbrook 2001, Pritchard, Havitz, and Howard 1999), switching behavior (Pritchard, Havitz, and

Howard 1999, Zeithaml, Berry, and Parasuraman 1996), and word-of-mouth (Reichheld 2003, Zeithaml, Berry, and Parasuraman 1996)—to reflect four attitudinal and behavioral intention indicators of loyalty that are commonly found in the literature We averaged responses to the four questions to obtain a multi-item measure of loyalty (Cronbach's α = 91)

We counterbalanced the placement of the scale anchors between participants For example, for half the participants, the attachment scale was anchored by "definitely to the hairdressing salon" (1) and "definitely to the hairdresser instead of the other way around" (7) Order did not have any significant effect on loyalty (all ps > 10), and we do not consider it further

Results

We estimated a linear regression model with gender and six product category dummies as independent variables and loyalty as the dependent variable The category dummies enabled us to capture the higher and lower levels of customer loyalty across product categories These dummies reflect gender-unspecific differences in loyalty between categories and thus are orthogonal to the gender effect, which is the focus of this study The results show a significant main effect for gender (b = 73, SE = 12, p < 001) in the predicted direction The effects of all category dummies (the base category is medical) are statistically significant (all ps < 001)[2] Table 2 depicts the mean loyalty scores per category

Discussion

The results in Study 3 support the hypothesis that in a direct comparison between individual service providers and the companies they work for, male consumers are more loyal to the companies (than to individual service providers) than female consumers We obtained these results using a loyalty scale that measured four different indicators of loyalty and relying on participants' actual consumer relationships across seven different product categories

TABLE 2
Mean Loyalty Scores of Studies 3, 4, and 5

Study 3[a]

Category	Employee Versus Company: Female	Employee Versus Company: Male
Hair	3 22	4 43
Bike repair	4 98	5 85
Sports	4 01	4 94
Travel	5 01	5 44
Bar	5 34	5 64
Clothing	5 85	6 39
Medical	2 20	4 15

Study 4

	Company		Employee	
Category	Female	Male	Female	Male
Hair	4 10	4 72	4 20	3 72
Sports	3 14	3 75	3 23	2 75
Physiotherapy	3 86	4 47	3 95	3 47
Clothing	3 82	4 43	3 91	3 43
Legal	3 51	4 12	3 60	3 12
Medical	4 12	4 74	4 22	3 74
Real estate	3 53	4 15	3 62	3 15

Study 5

	Company		Employee	
Category	Female	Male	Female	Male
Hair	4 78	4 95	5 31	4 46
Sports	3 74	4 70	5 63	4 44
Medical	5 60	5 62	5 49	5 30

[a] For Study 3, higher means imply stronger loyalty to the company (relative to the individual service provider)

Although the gender effect in the direct comparison setting of Study 3 was highly relevant from a managerial perspective, direct comparisons do not enable us to assess the underlying explanation of the effect Studies 1 and 2 suggest that the effect in Study 3 was because male self-construal is centered more on relationships with groups, whereas female self-construal is centered more on individual relationships Study 2 also shows that participants perceived companies and organizations as grouplike However, it is possible to explain the results of Study 3 not in terms of relational versus collective interdependence (Baumeister and Sommer 1997) but rather in terms of interdependence versus independence (Cross and Madson 1997a, b) That is, if male self-construal is centered on independence whereas female self-construal is more social, and if companies and organizations are viewed as nonsocial, female interdependence should lead to stronger loyalty to individual service providers Conversely, male independence should merely make men less loyal than women to individual service providers These differences should lead women to indicate greater loyalty to individual service employees than men in direct comparisons, even if men and women are equally loyal to firms Thus, it is important to assess whether all the action is on the individual employee side (as predicted by the interdependence versus independence theory) or whether men also show greater loyalty to firms than women in a setting in which there is no direct comparison between levels of loyalty to an employee versus company We designed Study 4 to address these issues by asking participants to indicate their loyalty to firms and individual employees separately

Even if men are more loyal to firms than women, this does not necessarily imply that the gender difference in loyalty to firms is mediated by self-construal in terms of collective interdependence We assessed the underlying process in Study 4 by measuring participants' self-construal. Finally, although student participants have meaningful relationships with firms and employees in the product categories used in our studies, we wanted to assess the generalizability of our effects to another population, thus we drew our sample from a general population of shoppers in New Zealand.

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[2] In Studies 3–5, the critical effects of gender remain significant if we remove all category dummies For Study 3, these effects are the main effect for gender (b = 73, SE = 15, p < 001), for Study 4, it is the interaction effect of gender with the dummy for employee versus company (b = 27, SE = 07, p < 001), and for Study 5, it is the interaction effect of gender with the dummy for employee versus company (b = 24, SE = 08, p < 01)

Study 4

In Study 4, we asked shoppers in a midsized city in New Zealand to indicate their level of loyalty toward individual employees and firms in seven service categories. We also measured their levels of independent, relationally interdependent, and collective interdependent self-construal.

Method

Sixty-five female and 67 male shoppers participated in a pen-and-paper study in exchange for a chocolate bar. Using a four-item loyalty scale, we asked participants to indicate the extent to which they were loyal to employees and companies in the following categories: (1) hairdresser/hairdressing salon, (2) sports apparel store salesperson/sports apparel store, (3) physiotherapist/physiotherapy clinic, (4) clothing salesperson/clothing store, (5) lawyer or solicitor/law firm, (6) general practitioner/medical center, and (7) real estate agent/real estate company.

We randomly assigned participants to one of two versions of the questionnaire. In the first version, the first category was represented by the employee (hairdresser), the second one by the company (sports apparel store), and so on. In the second version, the first category was represented by the company (hairdressing salon), the second by the employee (sports apparel store salesperson), and so on. We did this to ensure that both company and employee were rated for all categories, but not by the same participants.

For each category, participants answered four questions that assessed their loyalty to an actual, not imagined, individual employee or company before continuing to the next category. If participants did not have any experience with a given category, they were asked to leave the category blank. Similar to Study 3, the questions measured attachment, commitment, special effort to visit the place, and word-of-mouth recommendation. For example, for the individual hairdresser, we assessed attachment with the question, "How attached do you feel to your favorite hairdresser?" (1 = "not at all," and 7 = "very much"). We assessed commitment with the question, "How committed do you feel to your favorite hairdresser?" (1 = "not at all," and 7 = "very much"). We assessed special effort with the question, "Would you make a special effort to go to your favorite hairdresser?" (1 = "definitely not," and 7 = "definitely yes"). Finally, we assessed word-of-mouth recommendation with the question, "If a friend asks you for advice about hairdressing, how strongly would you recommend your favorite hairdresser?" (1 = "would not recommend at all," and 7 = "would strongly recommend"). In the company versions of these questions, we replaced "hairdresser" with "hair dressing salon." We averaged responses to the four questions to obtain a multi-item measure of loyalty (Cronbach's $\alpha = .92$).

After participants completed the loyalty questions for all categories, we measured their self-construal. We measured collective interdependence using Gabriel and Gardner's (1999) scale (Cronbach's $\alpha = .91$). We adopted the scale from Cross, Bacon, and Morris's (2000) work to measure relational interdependence ($\alpha = .86$). Finally, we measured independence using Singelis's (1994) scale. Because we used a sample from the general public, we removed three items from Singelis's scale that were relevant for students only (e.g., "Speaking up in class is not a problem for me"; for the shortened nine-item scale, $\alpha = .68$). The items used in each of the three scales appear in the Appendix.

To control for individual differences in the importance assigned to each of the service categories, we asked participants to indicate the extent to which each of the seven categories was important to them (1 = "not at all important," and 7 = "very important"). Finally, we asked participants to indicate their age group and gender.

Results

Loyalty. Because the response scales used to assess loyalty were identical for employees versus companies and because we explicitly manipulated employee versus company, we first conducted an omnibus regression analysis that included both employee and company loyalty scores. Thus, we estimated a linear regression model with gender, employee versus company, and their interaction, category importance, age, and six category dummies (to control for category differences in loyalty that are not specific to gender or to whether the object of loyalty was an individual employee or a company) as independent variables. Loyalty (the average of the four loyalty items) was the dependent variable. Mean loyalty scores appear in Table 2 (means for Studies 4 and 5 are marginal means, controlling for category importance).

The results of the full model regression analysis (Table 3, Model 1) show effects of several of the control variables. The main effect of category importance was significant ($b = .55$, $p < .001$), indicating that the more important a category was for a participant, the more loyal he or she was to a company or to an employee in this category. There were also significant main effect differences between the product categories.

The main effect of gender was not significant ($p > .10$). Thus, women did not report themselves as being significantly more loyal than men in general. The main effect of the dummy for individual employee (versus company) was significant and negative ($b = -.23$, $p = .001$), suggesting that, overall, participants tended to be more loyal to companies than to individual employees. Importantly, the interaction effect between gender and individual employee was statistically significant ($b = .27$, $p < .001$) and in the expected direction.

To interpret the interaction result, we conducted two additional linear regression analyses (Table 3, Models 2 and 3). These analyses were identical to the first analysis, but the data were split by the object of loyalty (individual

TABLE 3
Results of Regression Analysis (Study 4)

	Model 1: Pooled Across Company and Employee	Model 2: For Company Only	Model 3: For Employee Only
	Beta (SE)	Beta (SE)	Beta (SE)
Constant	1 05 (27)***	87 (42)*	1 17 (33)***
Gender (female = 1, male = –1)	– 02 (07)	– 27 (10)**	23 (09)**
Dummy for employee (employee = 1, company = –1)	– 23 (07)***		
Gender × dummy for employee	27 (07)***		
Category importance	55 (04)***	52 (05)***	58 (05)***
Age	07 (05)	14 (08)	< 001 (07)
Category hair	61 (27)*	69 (41)	58 (34)
Category sport	– 36 (27)	23 (41)	– 93 (34)**
Category physiotherapy	34 (29)	32 (44)	48 (38)
Category clothing	32 (27)	1 23 (42)**	– 58 (34)
Category lawyer	– 03 (30)	53 (45)	– 53 (37)
Category medical	62 (27)*	79 (42)	51 (34)
R-square	38	34	47

*p < 05
**p < 01
***p < 001

employee versus company) The analysis for loyalty to individual employees showed a significant, positive main effect of gender (b = 23, p = 01), implying that female participants rated themselves as significantly more loyal to individual employees than male participants The analysis for loyalty to companies showed that male participants rated themselves as significantly more loyal to companies than female participants (b = – 27, p < 01)

Self-construal measures As the relational versus collective interdependence theory of female and male self-construal posits, women scored higher than men on relational interdependence (M_{female} = 5 55, M_{male} = 4 83, F(1, 113) = 6 43, p = 01), whereas men scored significantly higher than women on collective interdependence (M_{female} = 3 84, M_{male} = 5 25, F(1, 115) = 16 74, p < 001)[3] As the relational versus collective interdependence theory posits (but not the independence versus interdependence theory), we found no significant difference on independence (M_{female} = 5 08, M_{male} = 5 04, F(1, 109) = 04, p > 10)

Mediation analyses To test whether (1) collective interdependence mediates the relationship between gender and loyalty to companies and (2) relational interdependence mediates the relationship between gender and loyalty to employees, we conducted mediation analyses (Baron and Kenny 1986) As we expected, the effect of gender on loyalty to companies was mediated by collectively interdependent self-construal (Z[Sobel] = 2 40, p = 02) That is, the effect of gender on collective interdependence was significant, with men scoring higher than women (b = – 39, SE = 12, p < 01) In addition, the effect of collective interdependence on loyalty to companies was significant (b = 49, SE = .09, p < 001) Higher levels of collective interdependence was associated with greater loyalty to companies Finally, the effect of gender on loyalty to companies was reduced when we controlled for collective interdependence and was no longer significant (b = 19, SE = 22, p > 10) As we expected, similar mediation analyses for relational interdependence and independence showed no significant mediation of the effect of gender on loyalty to companies (for relational interdependence, Z[Sobel] = 37, p > 10, for independence, Z[Sobel] = 73, p > 10)

As we expected, the effect of gender on loyalty to individual employees was mediated by relationally interdependent self-construal (Z[Sobel] = 2 60, p < 01) First, the effect of gender on relational interdependence was significant, with women scoring higher than men on relational interdependence (b = 75, SE = 10, p < 001) Second, the effect of relational interdependence on loyalty to individual employees was significant (b = 24, SE = 09, p < 01) Higher levels of relational interdependence was associated with greater loyalty to individual employees Finally, the effect of gender on loyalty to individual employees was reduced when we controlled for relational interdependence and was no longer significant at the 05 level (b = 34, SE = 18, p = 07) As we expected, similar mediation analyses for collective interdependence and independence showed no significant mediation of the effect of gender on loyalty to individual employees (for collective interdependence,

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[3] The degrees of freedom for the three self-construal measures vary slightly because some participants failed to answer at least one of the self-construal questions In all studies, we included the remaining responses by such participants included in our analyses

Z[Sobel] = 79, $p > 10$, for independence, Z[Sobel] = 78, $p > 10$)

Discussion

The results in Study 4 provide support for the relational versus collective interdependence explanation of the gender difference in direct comparisons of loyalty to individual employees versus firms that we found in Study 3 The effect of gender on loyalty was not solely driven by women's greater loyalty to individual employees We found that men reported greater loyalty to companies than women, which would not be predicted by the interdependence versus independence theory Further support for our hypotheses was provided by the mediation analyses, which showed that the gender effects on loyalty were not significantly mediated by independence, rather, the gender effect on loyalty to firms was mediated by collective interdependence, whereas the gender effect on loyalty to individual employees was mediated by relational interdependence

Although Study 4 enabled us to assess the underlying explanation of the effect of gender on loyalty, several issues remain First, in the previous studies, it was unclear what participants thought the gender was of the loyalty object (e g , the individual employee) This may provide an alternative explanation for some of our results if, for example, (1) men are more loyal to men, (2) women are more loyal to women, (3) male and female participants tend to believe that the individual service providers are women, and (4) male and female participants perceive groups and organizations as being composed mostly of men If these four conditions are satisfied, women may be more loyal to individual service providers, whereas men may be more loyal to companies This process could explain our core interaction between gender of participant and individual versus group or organization If this is the case, we should find that when measuring the gender of individuals and firms, loyalty should be explained by an interaction between gender of the loyalty object and gender of the participant (the gender match pairs of man–man and woman–woman yield greater loyalty than those of man–woman and woman–man)

Second, it is worthwhile to determine whether our core effect can be explained by differences in processing style between men and women For example, it is possible that (1) women have a more intuitive processing style, (2) people with an intuitive processing style are more loyal to individuals, (3) men have a more rational processing style, and (4) people with a more rational processing style are more loyal to groups and organizations If this is the case, we would expect that loyalty could be explained by two-way interaction effects between loyalty object (individual versus organization) and rational processing style and between loyalty object and intuitive processing style

Third, it is possible that participants' answers in the previous studies reflected socially desirable responses more than actual behavior For example, if it is socially desirable (1) for women to be loyal to individuals and (2) for men to be loyal to companies, we should find that our core interaction effect between participant gender and loyalty object (individual versus group or organization) on loyalty should be stronger for participants who have a stronger tendency for social desirability bias Thus, we should find a significant three-way interaction involving participant gender, loyalty object, and social desirability bias, indicating that the positive difference in loyalty to organizations between men and women is larger for people with a stronger social desirability bias and that the negative difference in loyalty to individuals between men and women is larger for people with a stronger social desirability bias We designed Study 5 to address these issues

Study 5

In Study 5, we replicated the results of Study 4 by asking New Zealand shoppers to indicate their level of loyalty toward individual employees and firms in three service categories In addition to relational and collective interdependent self-construal, we measured participants' processing style (rational versus intuitive), gender of the employee, "gender" of the company, and social desirability bias

Method

Seventy-one women and 79 men participated in exchange for chocolate eggs We asked participants to indicate the extent to which they were loyal to employees and companies from the following categories (1) hairdresser/hairdressing salon, (2) sports trainer/sports gym, and (3) general practitioner/medical center Similar to Study 4, we randomly assigned participants to one of two versions of the questionnaire In the first version, the first category was represented by the employee (hairdresser), the second one by the company (sports gym), and the third one by the employee again (general practitioner) This was reversed in the second version

For each category, participants were asked to answer questions assessing their loyalty to an actual, not imagined, individual employee or company before continuing to the next category, using a three-item loyalty scale we adapted from Price and Arnould's (1999) work The measures included commitment, special effort to visit the place, and loyalty For example, for the individual hairdresser, we measured commitment with the statement "I feel a commitment to continuing the relationship with my hairdresser" (1 = "strongly disagree," and 7 = "strongly agree") We measured special effort with the statement "I would expend extra effort to continue seeing my hairdresser" Finally, we measured loyalty with the statement "I feel loyal to my hairdresser" In the company version, we replaced "hairdresser" with "hairdressing salon" We averaged responses to obtain a three-item loyalty scale (Cronbach's $\alpha = 93$)

After participants completed the loyalty questions for all categories, we measured their collective ($\alpha = 93$) and relational ($\alpha = 91$) interdependence self-construal and category importance in the same way as in Study 4 Furthermore, we measured participants' processing style using the short version of the rational experimental inventory (Epstein et al 1996) The scale consists of two five-item subscales measuring rational ($\alpha = 67$) and intuitive ($\alpha =$

.80) processing styles. We also included a short version of Crowne and Marlowe's (1960) social desirability bias scale (Fisher 1993; Goldsmith and Hofacker 1991). To assess the gender of the loyalty object, we asked participants to indicate the gender of each individual employee (e.g., "What is the gender of your hair dresser?") and organization (e.g., "Are the majority of the people you come in contact with at your sports gym male or female?"). Finally, participants indicated their age group and gender.

Results

Loyalty. To analyze the loyalty results in Study 5, we estimated a linear regression model with participant gender, loyalty object (employee versus company), and their interaction, gender of the loyalty object and its interaction with participant gender, rational processing style and its interaction with loyalty object, intuitive processing style and its interaction with loyalty object, social desirability bias and its two-way interactions with participant gender and loyalty object, as well as its three-way interaction with both participant gender and loyalty object, participant age, category importance, and two category dummies as independent variables. Loyalty (the average of the three loyalty items) was the dependent variable (Table 4, Model 2; mean loyalty scores appear in Table 2). The main effect of gender was insignificant ($p > .10$). Thus, in general, women again did not report themselves as being significantly more loyal than men. The main effect of the dummy for individual employee versus company is also not significant ($p > .10$). Importantly, the focal interaction effect between gender and employee versus company was again statistically significant ($b = .60$, $p = .001$) and in the expected direction.[4]

To interpret the interaction result further, we conducted two additional linear regression analyses (Table 4, Models 3 and 4). These analyses were based on the variables in the first analysis, but the data were split by the object of loyalty (employee versus company). The analysis for loyalty to individual employees showed a significant main effect of gender ($b = -.68$, $p < .01$), implying that female participants rated themselves as significantly more loyal to individual employees than male participants. The analysis for loyalty to companies showed the opposite effect, as we expected. Male participants rated themselves as significantly more loyal to companies than female participants ($b = .56$, $p = .05$).

The results indicate that gender of the loyalty object and its interaction with participant gender were not significantly related to loyalty judgments ($ps > .10$). All effects, including processing styles, were not statistically significant as well (all $ps > .10$). The main effect of social desirability and its interaction with participant gender were not statistically significant in the full model ($ps > .10$). We found a significant interaction between social desirability and loyalty object ($b = .08$, $p = .01$), suggesting that people who give more socially desirable answers report greater loyalty to companies. However, a significant effect of the three-way interaction among social desirability, loyalty object, and participant gender ($b = -.08$, $p < .05$) suggests that men do this significantly less than women. Thus, women report greater loyalty to companies because of social desirability bias, but men do not. This effect would lead female participants to be more loyal to companies rather than to individual employees, which is the opposite of what we find. Thus, the data do not support a social desirability explanation of our core interaction effect that women are relatively more loyal to individual employees whereas men are relatively more loyal to companies. Indeed, the analyses indicate that our core interaction effect occurs despite social desirability bias.

Self-construal measures and mediation analyses. Consistent with the previous study, we find that women scored higher than men on relational interdependence ($M_{female} = 5.58$, $M_{male} = 5.14$, $F(1, 146) = 4.31$, $p = .01$), whereas men scored significantly higher than women on collective interdependence ($M_{female} = 4.58$, $M_{male} = 4.97$, $F(1, 146) = 5.27$, $p = .05$). We replicated the mediation of the effect of gender on loyalty to companies by collective interdependence ($Z[Sobel] = 1.91$, $p = .05$; effect of gender on collective interdependence: $b = .39$, $SE = .20$, $p = .05$; effect of collective interdependence on loyalty to companies: $b = .57$, $SE = .10$, $p < .001$; effect of gender on loyalty to companies when collective interdependence is included: $b = .01$, $SE = .24$, $p > .10$). As we expected, the effect of gender on loyalty to individual employees was mediated by relationally interdependent self-construal ($Z[Sobel] = 2.5$, $p < .05$; effect of gender on relational interdependence: $b = -.44$, $SE = .16$, $p < .01$; effect of relational interdependence on loyalty to individual employees: $b = .62$, $SE = .11$, $p < .01$; effect of gender on loyalty to individual employees when relational interdependence is included: $b = .34$, $SE = .22$, $p > .05$). As we expected, there was no significant mediation of the effect of gender on loyalty to companies by relational interdependence ($Z[Sobel] = .25$, $p > .10$) or of the effect of gender on loyalty to individual employees by collective interdependence ($Z[Sobel] = .16$, $p > .10$).

Discussion

In Study 5, we replicated the results of Study 4, controlling for potential alternative explanations of the results. Consistent with the previous studies, we find that men tend to rate themselves as more loyal to the companies, whereas women tend to rate themselves as more loyal to the individual service providers. Again, mediation analyses support the relational versus collective interdependence explanation of the gender differences to individual employees versus firms. We also ruled out alternative explanations that these results were driven by rational or intuitive processing styles and social desirability bias. Furthermore, we find that the effect of gender on loyalty is not driven by the perceived gender of that company or individual employee or its match with the customer's gender.

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[4] To assess the robustness of the focal interaction effect, we conducted an analysis that excluded all the interaction effects involving the control variables (see Table 4, Model 1). This analysis again showed a statistically significant interaction between the gender of the respondent and the loyalty object (employee versus company, $b = .25$, $p < .001$).

TABLE 4
Results of Regression Analysis (Study 5)

	Model 1: Pooled Across Companies and Employees (Without Interactions)	Model 2: Pooled Across Companies and Employees (All Variables)	Model 3: For Companies Only	Model 4: For Employees Only
	Beta (SE)	Beta (SE)	Beta (SE)	Beta (SE)
Constant	1 17	1 90	1 3	2 40
	(67)**	(66)**	(1 00)	(88)**
Gender (male = 1, female = –1)	– 09	– 08	56	– 68
	(08)	(18)	(28)*	(24)**
Loyalty object (company = 1, employee = –1)	– 03	– 34		
	(08)	(63)		
Gender × loyalty object	25	60		
	(08)***	(18)***		
Gender of the loyalty object	11	08	07	09
	(09)	(09)	(14)	(12)
Gender × gender of the loyalty object		02	09	– 05
		(09)	(14)	(11)
Rational processing style	01	03	04	– 09
	(12)	(12)	(18)	(15)
Rational processing style × loyalty object		02		
		(11)		
Intuitive processing style	18	18	14	24
	(12)	(13)	(18)	(18)
Intuitive processing style × loyalty object		– 05		
		(13)		
Social desirability	03	02	11	– 08
	(04)	(04)	(05)*	(05)
Social desirability × gender		004	– 07	– 08
		(03)	(05)	(05)
Social desirability × loyalty object		09		
		(03)**		
Social desirability × gender × loyalty object		– 08		
		(03)*		
Category importance	37	37	40	36
	(05)***	(05)***	(07)***	(07)***
Age	16	16	11	23
	(05)***	(05)***	(07)	(06)***
Category sport	– 25	– 23	– 37	– 05
	(11)*	(11)*	(16)*	(15)
Category medical	– 07	– 06	– 07	– 05
	(10)	(10)	(15)	(13)
R-square	26	29	28	31

*p < 05
**p < 01
***p < 001

General Discussion

Summary

Across five studies using different methodologies, samples, product categories, and measures of loyalty, we found a coherent pattern of gender differences in loyalty to individuals and employees versus groups and companies Contrary to common wisdom, female consumers did not always show stronger customer loyalty than male consumers In Study 1, women indicated a stronger likelihood than male participants to go the extra mile to buy a product from a store run by a single acquaintance (versus a nearby store) However, when the farther-away store was run by a group of acquaintances, men indicated a higher likelihood to buy from that store than women In Study 2, we asked participants to provide 20 completions of the sentence "I am loyal to ," and then we asked them to classify each of their answers as referring more to an individual or more to a group Individuals made up a larger share of loyalty objects that women listed than men listed The reverse was true for loyalty objects classified as groups Thus, Studies 1 and 2 supported the hypothesis that female consumers tend to be more loyal to individuals, whereas male consumers tend to be more loyal to groups

In Study 2, we also found that specific employees or service providers made up a larger share of loyalty objects among female participants, whereas companies or organizations represented a larger share of loyalty objects for men In Study 3, we used four different indicators of loyalty to construct a scale measuring loyalty to companies and organizations versus individual service providers We asked participants to use this loyalty scale to assess their real-world loyalties in seven product categories The results for this inventory of real-world loyalties suggested that women were more loyal than men to individual service providers relative to the corresponding companies or organizations In Studies 4 and 5, we further explored male versus female loyalty to individual employees and firms by manipulating the object of loyalty between subjects The results indicated not only that women were more loyal to individual employees than men but also that men were more loyal than women to companies The latter result is important because it enables us to distinguish between two explanations of the effect found in Study 3 The result regarding male participants in Studies 4 and 5 can be explained by a theory of male self-construal being centered on collective interdependence but not by a popular theory of male self-construal being centered on independence Support for a theory of male self-construal being centered on collective interdependence was further provided by mediation analyses, which showed that men's greater loyalty to groups was mediated by collectively interdependent self-construal but not by independent self-construal

Customer Loyalty

This research contributes to the study of customer loyalty by showing that female and male consumer loyalties are different The results suggest that female consumers tend to develop and maintain loyalties to individuals, whereas male consumers tend to be more loyal to groups This finding is not obvious, because popular theories of gender differences (Cross and Madson 1997b, Meyers-Levy 1988) suggest that women should be more loyal consumers regardless of the group versus individual nature of the loyalty object

The results also suggest that a similar gender difference applies to trade-offs between loyalty to individual service employees and loyalty to companies That is, when there is a direct comparison between loyalty to a favored employee and loyalty to the firm he or she works for or used to work for, men (women) indicated higher loyalty to the firm (employee) than women (men) Such trade-offs are important because they reflect common situations in which a favored employee leaves a company and in which a consumer can choose to stay loyal to the employee or to the company (Bendapudi and Leone 2001, 2002)

Gender Identity

In addition to their implications for consumer loyalty, our findings have implications for the study of gender identity in general First, we contribute to the debate about female and male gender identity being a matter of interdependence and independence versus different types of interdependence (Baumeister and Sommer 1997, Cross and Madson 1997a, b) The results in all our studies are consistent with the relational versus collective interdependence theory (Baumeister and Sommer 1997), which claims that female self-identity centers on close individual relationships and male self-identity centers on less intimate group relationships Second, we are the first to test the implications of relational versus collective interdependence theory (Baumeister and Sommer 1997) to loyalty instead of general self-construal (Gabriel and Gardner 1999) Third, we add to the relational versus collective interdependence theory (Baumeister and Sommer 1997) by showing differences between individual and group objects of loyalty in situations in which relationships are far from close (Study 1) By unconfounding relationship closeness and the individual versus group nature of relationships, our results suggest that female gender identity is more focused on individuals and less on groups than male gender identity, regardless of the closeness of the relationship

Managerial Implications

Our findings have several managerial implications In general, our findings suggest that companies targeting female consumers should depend more than companies targeting male consumers on relationships between individual employees and customers Whereas male consumers may be satisfied with an anonymous relationship with a store or chain, female consumers demand more personal, one-to-one relationships Compared with men, female consumers' allegiances may be more to specific employees than to a store or chain This may have implications for the distribution of power and the appropriability of resources between a company and its employees (Collis and Montgomery 1995, Wernerfelt 1984) For companies targeting female consumers, the customer relationship is controlled more by specific employees and less by the company than for companies targeting male consumers Thus, employees in companies serving female consumers could be rewarded a greater share of the companies' revenues than employees in companies serving male consumers

American Express estimated that approximately 30% of its investment advisers' clients would leave if their adviser left the company (Tax and Brown 1998) Our results indicate that this type of customer defection may become more problematic as the share of women in a company's customer base increases Our results also indicate that companies may want to use different strategies to prevent this kind of customer defection depending on the predominant gender of their customers For companies with a large share of male customers, strategies such as rotating key employees or assigning a team rather than one employee to a customer (Bendapudi and Leone 2002) may be more successful than for companies with predominantly female customers In general, moving from one contact to a small group of contacts, such as from a personal banker to a team of bankers, may have a more negative effect on female consumers' loyalty than on male consumers' loyalty

The difference between male and female consumer loyalty may also affect where people shop, depending on which format is more conducive to one-to-one relationships For example, small, boutique, owner-operated stores may be more conducive than larger chain operations when targeting women than when targeting men

The mediation of the effects of gender on loyalty by collective versus relational self-construal also provides opportunities to focus directly on the underlying mechanism The findings showing positive effects on brand attitude of using advertising themes that match a person's self-construal

(Wang et al 2000) suggest implications for the effectiveness of different advertising themes For companies targeting men, an advertising strategy that stresses group themes may engender more loyalty, whereas for companies targeting women, advertising themes focusing on personal relationships may be more suitable

Limitations and Further Research

In research such as ours, at least two concerns should always be taken into account First, using an individual difference measure as an independent variable necessitates caution with regard to causal factors that may drive the results and are merely correlated with gender, making the relationship between gender and the dependent variable a spurious one We addressed these concerns in our studies because our crossover interactions and mediation effects in Studies 1, 4, and 5 are difficult to explain using spurious correlates of gender Second, it is important to guard against demand effects For example, it is possible that the participants' responses do not reflect their true loyalties but rather that they guessed our hypotheses and tried to confirm them in their responses The results with respect to social desirability bias, and because gender was never mentioned to participants until the end of the study, do not support such an explanation In addition to these common concerns, we addressed explanations involving the gender of the loyalty object and participants' processing styles

Although we have provided some initial answers, our findings also raise many new questions For example, it would be worthwhile to explore the differences we found between men and women At a fundamental level, it is rather unclear what causes gender differences in self-construal Many authors have focused on social influences For example, differences have been documented in parenting styles and other social influences, beginning in early childhood, that could cause differences in self-construal (Maccoby 1990) Evolutionary psychologists (Buss and Kenrick 1998) have focused on an asymmetry between men and women in parental investment Wood and Eagly (2002) propose a biosocial account, which attributes gender differences to the combination of physical differences between men and women within the social, economic, technological, and ecological context Although such an exercise is beyond the scope of this article, it is not difficult to find constructionist, social, evolutionary, and biosocial explanations for our findings

Furthermore, it is unclear where brands stand in our framework Consumers can form relationships with brands that share many similarities with individual relationships (Fournier 1998) Conversely, it seems likely that consumers sometimes also equate brands with companies or organizations Our speculation is that women are more likely to develop "personal" relationships with brands, whereas men are more likely to treat brands as similar to companies or organizations In addition, brand communications may affect the fit between brand and male or female self-construal For example, anthropomorphizing a brand (e g , Aunt Jemima, Mr Clean) or introducing a Web page avatar (Wang, Baker, and Wakefield 2007) may appeal more to female consumers than to male consumers

Finally, it would be worthwhile to explore gender differences in the presence of the more intimate bonds some consumers have with products and brands For example, Fournier (1998) describes "committed partnerships" and "best friendships," which seem to go beyond the realm of the relationships studied here The same is true for the relationships brand community members have with their brands (Muñiz and O'Guinn 2001, Thompson and Sinha 2008)

Conclusion

Across five studies, our results suggest that male and female consumers differ significantly in terms of their loyalty to individuals (e g , individual employees) and groups and grouplike entities (e g , companies) Whereas women tend to be more loyal to individuals, men concentrate their loyalty more at the group level

Appendix
Measures of Self-Construal

Collective Interdependence

1 The groups I belong to are an important reflection of who I am
2 When I'm in a group, it often feels to me like that group is an important part of who I am
3 I usually feel a strong sense of pride when a group I belong to has an important accomplishment
4 I think one of the most important parts of who I am can be captured by looking at the groups I belong to and understanding who they are
5 When I think of myself, I often think of groups I belong to as well
6 In general, groups I belong to are an important part of my self-image
7 If a person insults a group I belong to, I feel personally insulated myself
8 My sense of pride comes from knowing I belong to groups
9 When I join a group, I usually develop a strong sense of identification with that group

Relational Interdependence

1 My close relationships are an important reflection of who I am
2 When I feel close to someone, it often feels to me like that person is an important part of who I am
3 I usually feel a strong sense of pride when someone close to me has an important accomplishment
4 I think one of the most important parts of who I am can be captured by looking at my close friends and understanding who they are
5 When I think of myself, I often think of my close friends or family also
6 If a person hurts someone close to me, I feel personally hurt as well
7 In general, my close relationships are an important part of my self-image
8 My sense of pride comes from knowing who I have as close friends
9 When I establish a close relationship with someone, I usually develop a strong sense of identification with that person

Independence

1 I'd rather say "no" directly than risk being misunderstood
2 Having a lively imagination is important to me
3 I am comfortable with being singled out for praise or reward
4 Being able to take care of myself is a primary concern for me
5 I act the same way no matter who I am with
6 I prefer to be direct and forthright when dealing with people I've just met
7 I enjoy being unique and different from others in many respects
8 My personal identity, independent of others, is very important to me
9 I value being in good health above everything

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Jin K. Han, Seh Woong Chung, & Yong Seok Sohn

Technology Convergence: When Do Consumers Prefer Converged Products to Dedicated Products?

In today's marketplace, many of the newer-generation convergence products (e.g., camera phones, all-in-one personal digital assistants) offer consumers product performance that rivals dedicated versions. With the increased availability of options, consumers now face another dilemma in their purchase consideration: Which product form should they choose—converged, dedicated, or both? This study investigates the choice patterns for product forms along the technology trajectories. In a series of four studies, the authors find that at low levels of technological performance, consumers overwhelmingly select convergence products over the dedicated options, whereas the choice pattern is reversed at high levels of technological performance. Furthermore, the authors demonstrate that a preannouncement of future technology can affect consumer preferences for product forms. Finally, they address the managerial implications and suggest directions for further research.

Keywords: digital convergence, technology trajectory, intercategory choice, product bundling, dilution effect

In recent years, technological advancements in consumer electronics have transformed consumer portable devices from mere gadgetry into ubiquitous lifestyle products (Gerson 2007). Reflecting this trend, the Consumer Electronic Association estimates that the category sales of "anywhere technologies" accounted for one-third of the $160 billion U.S. consumer electronics market in 2007–2008 and foresees continued growth for the next few years (Gerson 2007).[1] Not surprisingly, high-tech products, such as mobile phones, digital cameras, and MP3 players, have arguably become "consumer essentials" in this day and age, with more items in line to join the ranks. However, the dilemma soon becomes evident as the sheer number of high-tech products a modern-day consumer must manage quickly reaches unwieldy levels. To this end, firms have been turning their attention to the "convergence" notion as a seemingly logical product solution (*The Economist* 2005). Simply put, a convergence product is a digital-platform product bundle that physically integrates two or more digital-platform technologies into a common product form (e.g., a mobile phone and a digital camera into a camera phone).

On the supply side, several convergence products already offer consumers a legitimate alternative to dedicated product forms across a wide range of technology categories, for example, Apple's iPhone (mobile phone + MP3 player), Sony's PSP (game console + media player), and Samsung's Miniket (camcorder + digital camera + MP3 player + voice recorder). Nonetheless, the demand-side impact of the convergence strategy remains relatively unexplored in the academic literature to date. In particular, how does the introduction of a convergence product affect consumer preferences for the corresponding dedicated product options? As convergence products evolve up the technology trajectory, how stable are the product-form preferences? To better understand the underlying intercategory dynamics between converged and dedicated products, this study explores how consumers react to the notion of convergence at different stages in the technology trajectory.

Specifically, Study 1 investigates the demand-side perspective with a closer examination of the product-form choice patterns. We propose Christensen's (2000) buying-hierarchy framework (consisting of performance and convenience dimensions) to predict product-form choices at different levels of technology. Furthermore, Study 2 examines choice implications for consumers who form technological expectations on the basis of the preannouncement. In Study 3, we extend Study 1's results across different product-category combinations. Study 4 addresses a potential moderator that may attenuate the results in Studies 1 and 3. Finally, we discuss the theoretical and managerial implications for technology trajectory and product-line management.

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[1] The Consumer Electronic Association defines "anywhere technologies" to include digital cameras, camcorders, portable audio, portable communications, and electronic gaming products.

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Convergence Products: Background and Definition

Although the wave of convergence products into the mainstream is seemingly a contemporary phenomenon, the notion behind this product concept dates back to the traditional bundling practices. Referred to as "product bundling," manufacturers through the years have made various attempts to integrate different product categories—typically, in the name of convenience or versatility (Stremersch and Tellis 2002). Notwithstanding its intuitive appeal, prior attempts at product bundling have been met with limited success. For example, the video phone that was supposed to revolutionize business and consumer communication ended up as a costly failure for AT&T (Schnaars and Wymbs 2004), and the appeal of multifunction machines (printer, copier, scanner, and fax functions) never went beyond the niche segment of small-office/home-office customers (Kim, Han, and Srivastava 2002). The common denominator for the lackluster attempts was that consumers typically found "all-in-one" products to be more or less "underperforming *octopus peripherals*" (Crawford 2004, p. 59). Consequently, product bundling has remained largely a fringe product strategy—that is, until recently. With advancements in key technologies, especially in the areas of component miniaturization and digital processors, the market for a new wave of product bundling is no longer limited to niche products (Chan 2004).

Thus, the convergence product represents a renewed application of product bundling in the digital domain, and it is one of the fastest-growing product categories in consumer technology (Reinhardt, Tashiro, and Elgin 2004). Although the increasing availability and popularity of convergence products are altering the consumer-technology landscape, the extant research on product bundling or convergence remains rather scant. From both a theoretical and a managerial standpoint, a fundamental issue warranting closer examination is the convergence product's impact on consumer preference and choice—that is, how does the presence of a convergence product (e.g., camera phone) affect the consumer preference and choice decision with respect to the dedicated product counterparts (e.g., digital camera and mobile phone)? The answer may be contingent on the evolutionary stage of the technology, as we address subsequently.

Technology Trajectories

In the innovation literature, researchers have often looked to technology trajectories for insights into high-tech products (e.g., Christensen 2000; Norton and Bass 1987; Sood and Tellis 2005). As a trace of a given product's evolutionary path, the technology trajectory provides key markers along the product's life cycle—that is, when the technology undersupplies or begins to meet the required level of performance (Adner and Levinthal 2001), when the next-generation or substitute technology emerges (Norton and Bass 1987), or when the basis for competition shifts to a different attribute (Christensen 2000). Furthermore, in the context of multiple categories, technology trajectories facilitate the mapping of intercategory dynamics (Kim, Chang, and Shocker 2000).

Because the aim of our study is to explore the product-form preferences as technologies evolve, we section technology trajectories into two parts for investigation.[2] First, we examine consumers' product-form preferences when the convergence technology is in the early stages of commercialization. In general, manufacturers introduce convergence technology typically on a relatively lower trajectory—that is, the functional performance falls below the consumers' reference levels. For example, typical camera phones in the initial years were equipped with 300,000 to 400,000 pixels (e.g., VGA [video graphic array] quality, grainy picture resolution)—representing levels below the performance "sweet spot" as considered from the consumers' standpoint (Hughlett 2005). During this early phase, although the dedicated technology may or may not be above the sweet spot, its trajectory nonetheless remains above that of the convergence because the latter is typically a derivative technology of the former.

Second, with a sufficient progression in technology, specifications for convergence products are likely to catch up with the consumers' performance sweet spot. A potential implication is that a shift in consumer preferences may occur as the performance levels cross the threshold. The underlying rationale comes from prior research in psychology and marketing, which documents that consumers are prone to perception biases and differential choices relative to a reference level (e.g., Hardie, Johnson, and Fader 1993; Kahneman and Tversky 1979). Therefore, we reassess consumer preference for product form in this latter phase as well. We also ascertain how expectations of future technology affect preference for and choice of current product forms. In the following section, we address these intercategory issues and formulate hypotheses across the two phases by drawing from literature on new products and cognitive psychology.

Phase 1: When Convergence Technology Is Below the Consumer Reference Level

As a general industry practice, convergence technology initially emerges on a trajectory well below the consumers' reference level for pragmatic reasons (see Figure 1). Typically, at this stage, (1) the state-of-the-art has not progressed significantly much higher than the convergence technology, and (2) manufacturers are often constrained by either technical or cost considerations in wholly transferring or adapting the dedicated technology to the convergence platform. Correspondingly, the introduction of converged products in the lower end of the technology market presents consumers with the following intercategory choice situation: All else being equal, which product-form option would he or she choose?

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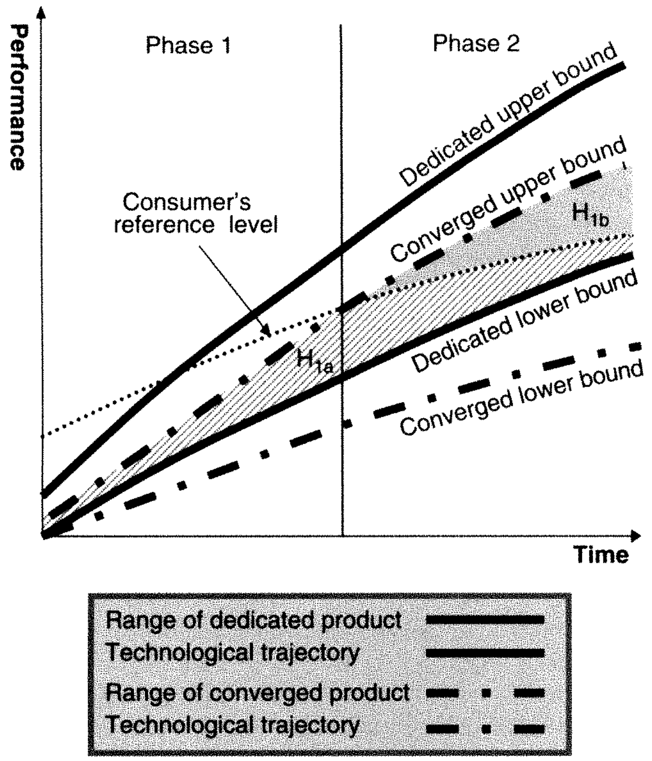
[2] Although there is a general consensus on the direction of technology trajectories (i.e., monotonically increasing in performance over time) in the extant literature, the particular shape of the trajectories remains inconclusive, as recently illustrated by Sood and Tellis (2005). Therefore, we do not make any assumptions about the shape of the technology trajectories in the scope of this study.

FIGURE 1
Dedicated and Converged Technology Trajectories



Option A: A camera phone with 1-megapixel resolution.

Option B: A digital camera with 1-megapixel resolution and a mobile phone of similar quality as in Option A.

According to Christensen (2000), consumers typically make buying decisions about high-tech products by following a buying hierarchy, with performance (functionality and reliability) considerations at the top, followed by the convenience dimension. To elaborate, performance differences among the options would dominate the choice decision. However, if this dimension does not play a discriminating role, convenience subsequently becomes the next choice criterion. Evidently, the buying hierarchy is not only limited to the high-tech product context; a recent study by Brito, Aguilar, and Brito (2007) found a similar effect in the service context. Thus, as long as performance levels remain below the consumers' sweet spot in the lower end of the technology market, we expect consumers to shift down in the buying hierarchy, where convenience becomes the salient competing dimension in their decision process.

A direct implication is that with convergence premised on the convenience benefit (e.g., multicategory functions packed into a single device), we would expect Option A (the converged product) to dominate Option B (the dedicated counterpart) in the lower end of the technology spectrum.[3] Formally,

H_{1a}: Consumers prefer the converged product option over its corresponding dedicated counterpart at low levels of technological performance for a common given feature.

Anecdotal evidence from category sales figures also seems to support this position: In the early years, when the mass-market digital camera technology had a relatively low-quality average resolution, the camera phones outsold dedicated digital cameras at a rate of two-to-one (Gleeson 2003). In other words, if a product lacks the required depth in its core competency (performance), the product's breadth of features (convenience) may become increasingly important for consumer decision making. Progressing up the technology trajectories (Phase 2), we next investigate consumers' product-form preferences when the embedded technology in convergence products satisfies consumers' reference standard.[4]

Phase 2: When Convergence Technology Is Above the Consumer Reference Level

In the evolution of technology trajectories, a sustained growth of the convergence category often leads to increased levels of technology transfer from the dedicated category, and vice versa. This is the very situation in the camera phone category today: The resolution in many camera phones is reaching upward of a 5-megapixel count—the same standard resolution available in many of the dedicated digital cameras sold in nonprofessional, consumer markets. At such levels, camera phones can produce respectable, large-sized images for printing and displaying on external devices.

If the technological performance of the convergence product has sufficiently fulfilled consumers' performance requirements in the latter phase of the technology trajectory (Phase 2), would there still be a systematic preference for a particular product form, all else being equal, in the following choices situation?

Option C: A camera phone with 5-megapixel resolution.

Option D: A digital camera with 5-megapixel resolution and a mobile phone of similar quality as in Option C.

Applying Christensen's (2000) buying hierarchy, we examine whether performance considerations, as the primary choice criterion, are likely to be activated in consumers' minds at the higher end of the technology trajectory. Although the objective performance specifications may be equivalent between Options C and D, a recent study in cognitive psychology by Zhang, Fishbach, and Kruglanski (2007) indicates that product-form differences in themselves may lead to differential performance perceptions.

Specifically, Zhang, Fishbach, and Kruglanski (2007) address how consumers cope with multiple goals that are associated with a shared path, which has a direct implication for convergence products. In a series of experiments, Zhang, Fishbach, and Kruglanski show that as the number of goals associated with a given means increased, consumers revealed a tendency to discount the means' effectiveness in achieving these goals. The underlying rationale of the dilution process is that consumers establish a connection between a goal and a means through association, and the key factor underlying the association strength is the uniqueness of its path to the means (Anderson 1983). However, associating additional goals with the means takes away the exclusiveness of that path, thus weakening the strength of the association. A direct implication is that with multiple goals being intrinsic to the convergence notion, consumers are likely to discount the expected performances of the integrated category functions. Therefore, Option D (dedicated option) is likely to dominate Option C (convergence option), in line with Zhang, Fishbach, and Kruglanski's work. Accordingly, we formally state the hypothesis on the consumer preference in Phase 2 as follows:

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[3] Hereinafter, we define "low" and "high" levels of performance relative to consumers' sweet spot (e.g., reference level) and operationalize the reference level as that which is perceived as prevalent in the market.

[4] In Phase 2, there may be a range of convergence products that are still below the consumers' reference level, but the state-of-the-art convergence products will be above the consumers' reference level, as Figure 1 indicates.

> H_{1b}: Consumers prefer the dedicated product option over its corresponding converged counterpart at high levels of technological performance for a common given feature.

In summary, at low levels of technological performance, consumers are likely to resign themselves to substandard functional performance in either option; thus, they will look to another decision criterion for deriving utility (e.g., convenience, which is provided by the convergence option). Furthermore, because they resign themselves to less-than-satisfactory performance, they do not deeply process the means that lead to performance goals and thus do not trigger the goal-dilution process. In contrast, at high levels of technological performance, consumers know that their functional performance goals can be realized/exceeded and thus are willing to pursue the attainment of functional goals as their primary objective, even at the expense of convenience. Guided by functional performance as the salient decision criterion, they process the means by which a product will deliver those goals more deeply, which leads to the goal-dilution effect, and in turn, they reject the convergence in favor of the dedicated option.

Study 1

Method

Fifty-one undergraduate business students participated in exchange for course credit. The participants received questionnaires containing information about two options of product forms (for a sample questionnaire, see Appendix A). The first option consisted of two dedicated products: a mobile phone and a digital camera. The second option was a converged product: a camera phone that combines the functions of a mobile phone and a digital camera in a single physical unit. We counterbalanced the order of the product-form options. Participants' task was to indicate which of the two product forms they would choose.

The between-subjects experimental design consisted of a low-performance condition and a high-performance condition. The dependent variable was product-form choice between the two options. In the low-performance condition, the 1-megapixel resolution level was given in both the converged and the dedicated product-form options. In the high-performance condition, it was set at the 5-megapixel level. The 1-megapixel level represented both the higher end of the camera phones and the lower end of digital cameras at the time of data collection (at the end of 2004); analogously, we selected the 5-megapixel level to reflect the high end of technological standards. For example, "the sweet spot for mass sales of digital cameras … last year … was 3 to 4 megapixels, and this year it will likely rise again" (Hughlett 2005, p. 1). The price level was the same for either product-form option: for example, $400 for a 1-megapixel camera phone or $400 for a 1-megapixel digital camera and a mobile phone. This price level was based on a pretest of prices that undergraduate students paid for a mobile phone, rounded to the nearest hundred-dollar level of $300, and for the digital camera, the industry average was more or less $100 per megapixel.

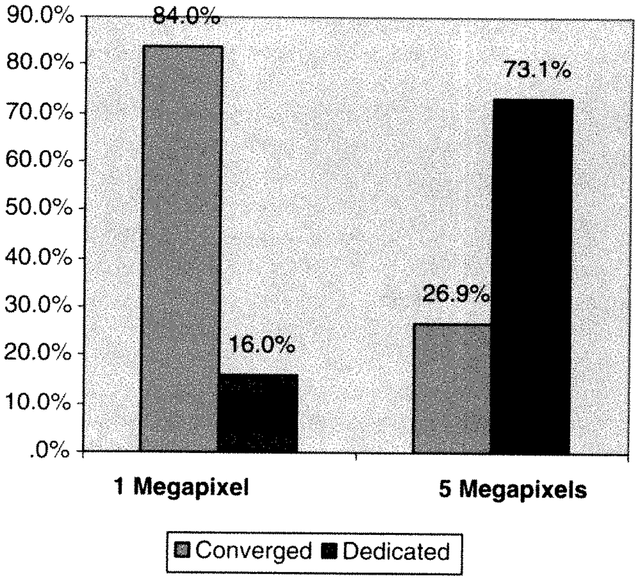
Measures

At the end of the questionnaire, there was a set of questions that measured the performance reservation value of the picture resolution and also the future purchase intention of the camera phone and the digital camera of higher performance. We used seven-point scales, ranging from 1 to 7 megapixels, to measure the performance reservation values for the digital camera and the camera phone. Specifically, participants were asked to indicate the minimum megapixel level they would consider an acceptable performance requirement for a digital camera and for a camera phone.

Results

In H_{1a} (H_{1b}), we predicted that more consumers would prefer the converged (dedicated) product form at low (high) levels of technological performance (see Figure 2). In support of these hypotheses, participants were significantly

FIGURE 2
Preference for Product Forms: Mobile Phone/Digital Camera



more likely to choose the converged product form in the low-performance condition, whereas the opposite was true in the high-performance condition ($\chi^2 = 14.38$, $p = .0001$). Of the participants, 84% (21 of 25) chose the converged product option in the low-performance condition, compared with 26.9% (7 of 26) in the high-performance condition.

Furthermore, the examination of the performance reservation values (see Table 1) revealed strong support for Zhang, Fishbach, and Kruglanski's (2007) performance-discounting theory on multiple goals with a shared means: The performance reservation value was higher for the digital camera than for the camera phone in both the high-performance condition (M = 3.54 versus 1.96; t = 13.916, $p < .001$) and the low-performance condition (M = 2.96 versus 1.52; t = 11.066, $p < .001$).

Discussion

Overall, the results are consistent with Christensen's (2000) buying-hierarchy framework. That is, when the performance level was below the sweet spot, the converged option emerged as the preferred choice, which lends support to the notion that convenience becomes the salient criterion when performance is no longer a competing factor. Moreover, when the performance was above the threshold, the dedicated option was the more preferred choice, which is consistent with the explanation of performance discounting. Although we expected performance discounting to occur only in the high-performance condition, we also observed differential performance threshold values among product forms in the low-performance condition. Nonetheless, below the threshold, the discounting effect evidently is rather inconsequential because consumers are likely to place more weight on a nonperformance dimension as convenience, as manifested in dominant choice shares of the converged option. This finding further strengthens the buying-hierarchy explanation for the observed preferences in the intercategory context.

Phase 2+: When Consumers Form Expectations on Future Technology Trajectory

An inherent facet of a high-tech product category is the continued progression of performance along its technology trajectory (Adner and Levinthal 2001; Christensen 2000; Kim, Han, and Srivastava 2002; Sood, Ashish, and Tellis 2005). Accordingly, several studies have reported that many consumers are cognizant of the general trend of improving performances (and declining prices) in high-tech categories (Balcer and Lippman 1984; Bridges, Yim, and Briesch 1995; Mick and Fournier 1998). In addition, consumers' expectations for future technology have been shown to affect their choice decisions in the present (Balcer and Lippman 1984; Bridges, Yim, and Briesch 1995; Kim, Han, and Srivastava 2002). The underlying mechanism is that formation of technological expectation leads consumers to update their currently held threshold values. Study 1 underscored the importance of performance thresholds in product-form preferences; next, we explore the impact of technological expectation in an intercategory choice situation.

To address whether and how the formation of future technological expectation is likely to affect product-form preferences, we consider a popular industry practice of leveraging consumer expectations on future technology—namely, the preannouncement strategy (Robertson, Eliashberg, and Rymon 1995). In general, firms make preannouncements of upcoming new products/technologies to consumers and/or to the trade, often with an intent to signal preemption against new entry (Robertson, Eliashberg, and Rymon 1995) or predation against existing competitors (Bayus, Jain, and Rao 2001; Farrell and Saloner 1986). In essence, these firms bank on the "anchor-and-adjustment" heuristic for the preannouncement to work. That is, the information the preannouncement provides will act as an "anchor" for consumers to "adjust" their current requirements (Epley and Gilovich 2006).

Accordingly, our contention is that a preannouncement for an impending technology is likely to affect the threshold values associated with product forms, and in turn, this results in the shifting of product-form preferences if the dedicated option in the current choice set falls below the newly adjusted threshold value. The rationale is as follows: Consider the two following options, accompanied by a preannouncement that 7-megapixel technology is expected to come to the market in the next quarter:

> Option E: A camera phone with 5-megapixel resolution.
>
> Option F: A digital camera with 5-megapixel resolution and a mobile phone of similar quality as in Option E.

Through preannouncement, if the state-of-the-art technology is now raised from the 5-megapixel to the 7-megapixel level, such information per se may affect consumers' product-form preferences at the 5-megapixel level. Specifically, with 7 megapixels acting as a new salient anchor, consumers are likely to apply the anchoring-and-adjustment heuristic to their performance threshold in an upward direction toward the 7-megapixel level (Epley and Gilovich 2006).

Regarding the extent of the adjustment, the anchoring-and-adjustment heuristic remains indeterminate—the adjustment is typically "insufficient" relative to the anchor (Epley and Gilovich 2006). Accordingly, in the scope of this study, we do not address the magnitude of the adjustment but only that an upward adjustment will occur, which in turn will result in a relatively higher sweet spot and, thus, an increased preference for the converged option compared with the no-preannouncement context. Stated formally,

> H_2: A preannouncement of a forthcoming higher technology level leads to a relatively higher (lower) consumer prefer-

TABLE 1
Performance Threshold Values: 1 Versus 5 Megapixels

Product Form	1 Megapixel (n = 25)	5 Megapixels (n = 26)
Digital camera	2.96	3.54
Camera phone	1.52	1.96

ence for the converged (dedicated) product option than the control condition with no preannouncement.

Study 2

Method

In Study 2, we used 77 participants to test H_2. Participants received questionnaires containing information about digital camera and mobile phone functions in both dedicated and converged forms, and they were asked to indicate which form they would prefer. The between-subjects experimental design consisted of a preannouncement condition and a no-preannouncement condition. In the preannouncement condition, participants were asked to choose between a 5-megapixel digital camera and a camera phone with a 5-megapixel digital camera function, given that a 7-megapixel model would be introduced in three months. In the no-preannouncement condition, no information about the preannouncement was given; participants were simply told to make the choice between the two product-form options.

Results

Consistent with H_2, preference for the dedicated product form shifted toward the converged product form when the preannouncement was made (see Figure 3). Of the participants, 46% (17 of 37) chose the dedicated product form in the preannouncement condition, compared with 77% (28 of 40) in the no-preannouncement condition ($\chi^2 = 4.59$, $p = .03$).

An examination of the performance reservation values revealed that for both the digital camera and the camera phone, they shifted upward with the preannouncement of future technological advances (see Table 2). For the digital camera, the performance reservation value was higher in the preannouncement condition than in the no-preannouncement condition (M = 4.70 versus 3.89; F = 13.455, $p < .0001$). Similarly, the performance reservation value for the camera phone was higher in the preannouncement condition than in the no-preannouncement condition (M = 2.50 versus 2.03; F = 4.301, $p = .042$).

FIGURE 3
Preference for Product Forms: Preannouncement Effect

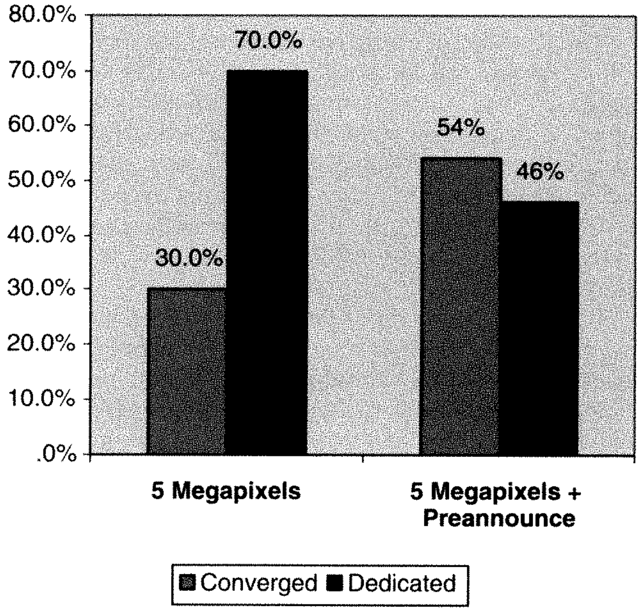


TABLE 2
Performance Threshold Values: The Impact of Preannouncement

Product Form	No Preannouncement (n = 40)	Preannouncement (n = 37)
Digital camera	3.89	4.70
Camera phone	2.03	2.50

Discussion

Although the results across Studies 1 and 2 reinforce the notion that product-form preferences are contingent on threshold values, there are two related issues that remain unresolved. The first is that price of the convergence base was relatively more expensive than that of the converged feature in the low-technology situation, whereas the reverse was the case in the high-technology situation. Therefore, price effect cannot be ruled out as an alternative source of differential results. The second is the generalizability of the results across other category combinations (e.g., digital camera and MP3 player). In addition, we aim to assess whether there are any differences in usability perceptions across product forms. Study 3 addresses these issues.

Study 3

Method

Study 3 employs different category combinations to examine the robustness of the results of Study 1. In Study 3, digital camera is the platform category, and MP3 player is the category being integrated onto the digital camera base in the convergence option. Seventy-five undergraduate business students participated in this experiment in exchange for course credit. The methodology used in Study 3 was similar to that of Study 1, except that different categories were used. Participants received questionnaires containing information about two options of product forms. The first option was a purchase consisting of two dedicated products: a digital camera and an MP3 player. The second option was a purchase of a converged product: a digital camera with a converged MP3 player. The procedure and the dependent variable remained the same as those used in Study 1. The between-subjects experimental factor was a low-performance digital camera versus a high-performance digital camera. Unlike in Study 1, however, the high-performance (low-performance) digital camera was set at 8 megapixels (2 megapixels) to reflect the high end (low end) of technological standards at the time of Study 3. The price level was kept at a constant ratio (two-to-one) between the digital camera and the MP3 player: $400 for an 8-megapixel digital camera and $200 for the MP3 player, or $600 combined in the high-performance condition, and $100 for a 2-megapixel digital camera and $50 for the MP3 player, or $150 combined in the low-performance condition.

There was a set of two questions at the end of the questionnaire. The first question was intended as a manipulation check, in which participants were asked about the perceived performance of the digital camera in question. Specifically, participants were asked, "Is the 2-megapixel digital camera (8 megapixels in the high-performance digital camera condition) lower or higher than the level of resolution currently prevailing in the market?" We used a five-point scale, anchored by "much lower" (1) and "much higher" (5). The second question measured the perceived ease of use of the dedicated and the converged product forms. Participants were asked, "Which option is easier to use: Option A (dedicated) or Option B (converged)?" We used a five-point scale, anchored by "definitely Option A" and "definitely Option B."

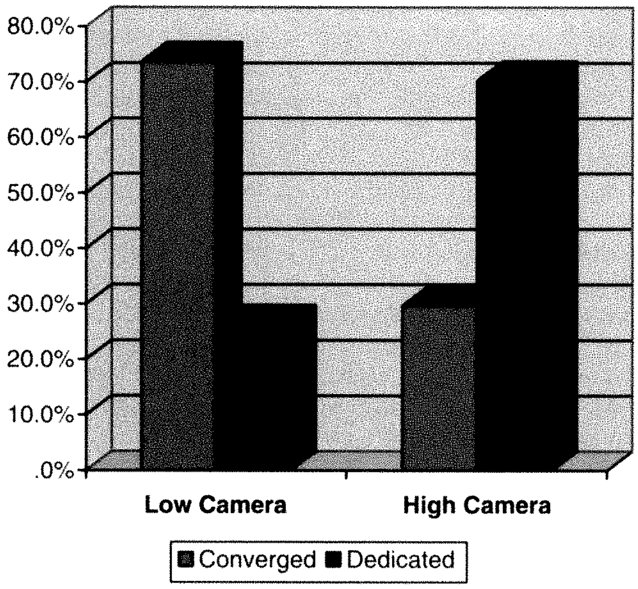
Results

Responses to the manipulation check revealed that the manipulation was successful. Participants in the low-performance digital camera condition indicated that the 2-megapixel camera was lower than the currently prevailing level (M = 1.29), whereas those in the high-performance digital camera condition indicated that the 8-megapixel camera was higher than the currently prevailing level (M = 4.27). This difference was statistically significant (F = 526.08, *p* = .00).

The results were consistent with those in Study 1, thus providing some external validity to Study 1's findings (see Figure 4).[5] Participants were significantly more likely to choose the converged product form in the low-performance digital camera condition, whereas the opposite was true in the high-performance digital camera condition ($\chi^2 = 13.49$, $p = .00$). Of the participants, 74% (28 of 38) chose the converged product option in the low-performance digital camera condition, compared with 30% (11 of 37) in the high-performance digital camera condition.

The performance level of the digital camera had no effect on perceived ease of use with respect to dedicated versus converged product forms. Participants in both the high- and the low-performance digital camera conditions indicated that the dedicated and the converged product forms were about the same with respect to ease of use (M = 3.11 and M = 2.97 for low- and high-performance conditions, respectively; F = .277, *p* = .60).

FIGURE 4
Preference for Product Forms: Digital Camera/MP3 Player



Discussion

Our findings are consistent with Zhang, Fishbach, and Kruglanski's (2007) performance-discounting theory when either the platform category (Study 3) or the category being converged (Study 1) is at the higher end of the technology trajectory. In addition, we ruled out two potential alternative explanations for the observed product-form preference pattern. Even when we held price level at a constant ratio between the platform and the added categories, we still observed the same pattern of results. Moreover, participants did not perceive differences in usability costs across the product forms at both low and high performance levels.

The robustness of the results raises an important question for manufacturers: Is there no way for a convergence product to be successful at the higher end of the technological trajectory? For example, Philips CD-i (an ambitious home-entertainment console that offered multiple interactive audio/video functions, including playback, games, and karaoke) introduced in the late 1980s ended up costing the firm more than $1 billion in losses. A more recent example from the industry context comes from Sony's Cyber-shot DSC-G1 (a 6-megapixel digital camera with a built-in MP3 player) launched in March 2007. Since its introduction, the product concept has evidently not been well received in the marketplace, which prompted a highly unusual move by the manufacturer to quickly reposition the MP3 function into "background music function for slideshows."

In essence, Sony's repositioning is an attempt to highlight the relatedness among the multicategory functions in relation to their distinctiveness. The resultant positioning then becomes conceptually akin to a single-category product with enhanced perceived capability (a digital camera with background music function for a slideshow). This latter positioning (i.e., adding more features to a product) has been shown to be an appealing product strategy in a single-category context (Thompson, Hamilton, and Rust 2005). The overriding question then becomes whether the phenomenon of enhanced perceived capability can successfully be emulated in a multicategory context, which would be of great interest from both a theoretical and a managerial standpoint.

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[5] In addition, patterns of performance threshold values were consistent with those of Study 1.

Revisiting Zhang, Fishbach, and Kruglanski (2007) for insights, we note that the extent of goal distinctiveness tends to moderate the discounting effect arising from a shared means. Specifically, Zhang, Fishbach, and Kruglanski show that priming participants on similar aspects of multiple goals (e.g., a writing task on goal similarity between reducing health risks and getting more nutrition) attenuated the discounting effect despite the shared means (e.g., organic food). We further extend the work of Thompson, Hamilton, and Rust (2005) by examining the effect in a multicategory context and also that of Zhang, Fishbach, and Kruglanski to a product context in Study 4.

Study 4

Method

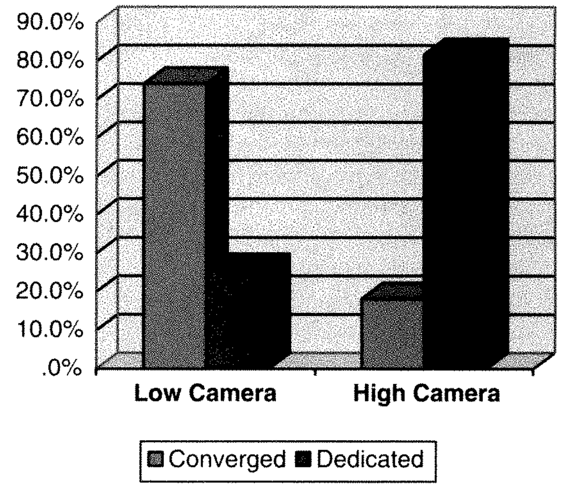
In Study 4, we introduce a new condition by adding "relational-processing" manipulation (Meyers-Levy 1991), which is similar to the task in Zhang, Fishbach, and Kruglanski's (2007) study. To induce relational processing, we first presented the participants with a relational scenario of a digital camera with an MP3 function that included "slideshow with background music." We then asked the participants to come up with possible taglines for a print advertisement (see Appendix B). The control condition is without the relational-processing task—in essence, a replication of Study 3. In Study 4, we did away with price information to rule out any possible signaling effects of pricing on preferences. The dependent variable and all other procedures remained the same as in Study 3. Thus, the experiment consisted of a 2 (digital camera performance: high versus low) × 2 (relational-processing instruction versus no processing instruction) between-subjects design. One hundred thirty-two undergraduate business students participated in the experiment in exchange for course credit. At the end of the questionnaire, there was a measure that assessed the perceived goal relatedness between the digital camera and the MP3 player: "How closely related are the goals associated with digital camera and MP3 player functions?" We used a five-point scale, anchored by "definitely unrelated" (1) and "definitely related" (5).

Results

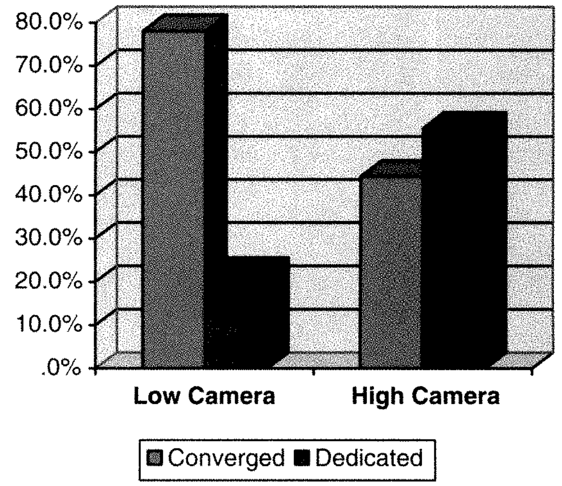
The analysis of the "relatedness" question revealed that the manipulation was successful. The perceived relatedness was higher in the relational-processing condition than in the control condition (M = 3.90 and 2.19; F = 99.39, $p = .00$). Figure 5 illustrates the results of Study 4. To examine the role of relational-processing instruction, we performed a series of contrast analyses using logistic regression. When we provided no processing instruction, 82% of the participants chose the dedicated product form in the high-performance digital camera condition, compared with 26% in the low-performance digital camera condition ($\chi^2 = 17.72$, $p = .00$), replicating the results of Study 3. When we provided the relational-processing instruction, the digital camera performance level had a smaller but still significant impact on product-form choice ($\chi^2 = 6.86$, $p = .01$). Notably, the relational-processing instruction played a significant role in reducing the preference for the dedicated product form in the high-performance camera conditions from 82% to 56% ($\chi^2 = 4.10$, $p = .04$).

FIGURE 5
Relational Processing and Preference for Product Forms: Digital Camera/MP3 Player

Control



Relational Processing



Discussion

Tasking participants on functional relatedness led to attenuation in performance discounting in the high-performance condition compared with the control condition. Consistent with the performance results, comparison of choice shares for the convergence product form shows gains in task versus control condition. Although the relational-processing task attenuates the performance discounting, the effect is still not strong enough to overcome the discounting effect to be on par with the perceived performances of dedicated product forms.

General Discussion

Despite the escalating importance of convergence movement in the portable consumer technology sector, the topic remains relatively unexplored in the literature to date. Therefore, the objective of this research was to provide the initial groundwork and motivation for studying the intercategory dynamics among converged and dedicated product forms. We approached the issue from the demand-side perspective along the technology trajectories. In the process, we found some regularities in consumers' decision making. Foremost, consumers showed a tendency to select converged product forms over dedicated ones when the level of technological performance was relatively low; however, the pattern of choice was reversed for relatively high technological performance levels.

One theoretical account forwarded is the buying-hierarchy explanation. That is, at lower technology levels, in which performance is not a significant factor, we found that consumers value the convenience dimension and thus select the convergence option. However, at higher technology levels, in which the performance dimension becomes salient, consumers tend to select the dedicated option. The underlying logic is that, in general, consumers discount perceived performance when there are multiple goals associated with a shared path. Nonetheless, our findings indicate that manufacturers may attenuate this discounting effect when making salient some related aspects among the multiple goals.

We also examined consumer reactions when there is a preannouncement of a forthcoming higher-level technology. Evidently, consumers adapt their reservation values accordingly. The result is a shift of shares toward the converged form at current high technology levels—perhaps attributable to a higher likelihood of the dedicated ones falling below the newly adjusted set of reservation values. Traditionally, the preannouncement literature has focused on new product announcements as signals of preemption against new entry (i.e., Roberston, Eliashberg, and Rymon 1995) or predation against existing competitors (i.e., Bayus, Jain, and Rao 2001; Farrell and Saloner 1986). Our finding introduces an additional dimension to a preannouncement's impact for product-line management considerations—namely, that consumers' preference for the product form may be influenced—in addition to the already identified dimensions of purchase timing, brand choice, and generation choice in the extant literature on preannouncements.

Finally, for an exploratory insight into the future upgrading patterns by converged- versus dedicated-product owners, we further examined the purchase intention measures collected in Study 1. Participants in the low-performance condition were asked about their purchase intentions of a 5-megapixel digital camera/camera phone, assuming that they had already bought 1-megapixel digital camera/camera phone. We measured purchase intentions on five-point scales ranging from "very unlikely" (1) to "very likely" (5). Our findings show that when the participants imagined that they had already bought a 1-megapixel camera phone, their purchase intention was higher for the 5-megapixel digital camera (M = 4.04) than for the 5-megapixel camera phone (M = 2.82; t = 4.22, p = .0001). Moreover, when the participants imagined that they had already bought a 1-megapixel digital camera, their purchase intention was higher for the 5-megapixel digital camera (M = 3.86) than for the 5-megapixel camera phone (M = 2.89; t = 3.58, p = .0001). Thus, regardless of the product-form ownership at the low level of technological performance, there is a clear pattern of greater preference for the dedicated product form at the high performance level. This exploratory analysis suggests that the robustness of the study's main findings can extend beyond initial purchases to upgrade occasions as well.

Managerial Implications

The demand-side perspective of the "anywhere technologies" market has yielded several key managerial implications for the supply side. First, our study shows that consumers prefer the convergence option at low technological levels but dedicated forms at the high end. From a product-line management standpoint, manufacturers should pursue a tiered product-form strategy, offering convergence varieties at the lower end of the technological trajectory and keeping the dedicated products in the trajectory's more advanced sections. Second, the focus should be on elaborating on the convenience benefits for the converged products instead of the performance dimensions. Indeed, a lesson can be learned from the all-in-one shampoo (shampoo + conditioner) manufacturers' strategy of emphasizing the convenience (e.g., time-saving "wash-and-go" feature) benefits for such products rather than the intrinsic performance aspects. For high-performance dedicated products, the key positioning strategy should be to highlight their core functional performance and to avoid attracting attention to any nonessential aspects that may dilute performance perceptions.

Nonetheless, a manufacturer that still wants to pursue a high-performance convergence strategy—for example, companies such as Samsung and LG Electronics are at the forefront of pushing 8-megapixel camera phones into today's marketplace—should consider (1) designing the product so that the integrated features have some functional synergy with the core feature and (2) highlighting this information in the communication campaign. This recommendation is based on our finding that inducing consumers to consider relatedness among the different features in convergence products somewhat mitigates the "jack-of-all-trades/master-of-none" concern.

Finally, the ownership figures show a significant number of consumers possessing both product forms in the case of camera phones and digital cameras (*Softpedia News* 2005). As we deduced in our exploratory analysis, the product portfolio of ownership is likely to comprise a lower-performance camera phone and a higher-performance digital camera. For retailers, such a pattern signals an opportunity to pursue a mixed-bundling strategy (Stremersch and Tellis 2002)—that is, offering consumers price discounts for buying a package that consists of a lower-technology convergence product and a higher-technology dedicated product, again focusing on the convenience benefits for the former and the performance facet for the latter.

Limitations and Further Research

In this research, we forward the performance-discounting theory as a key underpinning phenomenon that drives the preference for dedicated over converged options at high performance levels. However, it is also possible that consumers consider different usage situations for converged versus dedicated products. Further research should examine the usage context in product-form decisions and also assess process measures to build greater confidence in the proposed processes.

We studied the intercategory dynamics at the category level and without considering brand effects. Because there are firms that are primarily known for digital cameras only (e.g., Canon, Olympus), for mobile phones (e.g., Nokia, Motorola), or for both (e.g., Samsung, Sony), further research could investigate how the breadth of expertise moderates consumer preferences for product forms.

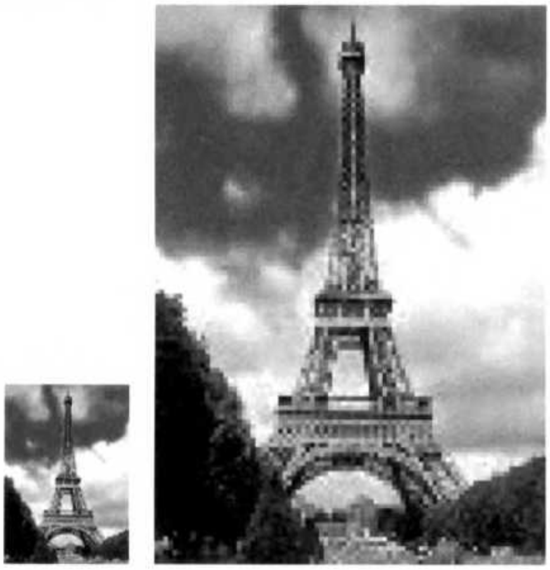
In addition, we examined technologies with performance levels that span from below to above the reference levels held by consumers. From a product life-cycle standpoint, these stages are characteristic of introductory and growth stages. In the maturity stage, several generations of products are often available concurrently in the marketplace. In this research, we presented choice tasks that are limited to the same technology levels of different product forms, though we assessed participants' purchase intentions for higher-generation products. There is an opportunity for further research to directly explore consumer preferences for product forms in a multigeneration setting. Finally, we focused solely on portable convergence products. Investigating the intercategory issues in the context of nonportable categories of converged and dedicated products is warranted for a greater generalizability to the current findings; we also leave this for further research.

APPENDIX A
Study 1: Sample Questionnaire

Low-Performance Condition

Instructions. We are interested in learning about your preference on mobile phones, digital cameras, and camera phones. Please complete all the questions.

Note: Sample resolution of a 1-megapixel image (actual picture sizes)



Imagine that you are considering the following package at the store. Assume that you presently do not own any of the following products:

Option 1: Price $400 (total price of two separate products)
- Mobile phone ($300)
- Digital camera with 1 megapixel ($100)

Option 2: Price $400
- Integrated camera phone
  - ➢with a 1-megapixel digital camera function

Which would you choose between Option 1 and Option 2? (please circle one):

1. Option 1 (buying two separate products)
2. Option 2 (buying one product with two features)

High-Performance Condition

Instructions: We are interested in learning about your preference on mobile phones, digital cameras, and camera phones. Please complete all the questions.

Note: Sample resolution of a 5-megapixel image

Imagine that you are considering the following package at the store. Assume that you presently do not own any of the following products:

Option 1: Price $800 (total price of two separate products)
- Mobile phone ($300)
- Digital camera with 5 megapixels ($500)

Option 2: Price $800
- Integrated camera phone
  - ➢with a 5-megapixel digital camera function

Which would you choose between Option 1 and Option 2? (please circle one):

1. Option 1 (buying two separate products)
2. Option 2 (buying one product with two features)

APPENDIX B
Study 4: Relational-Processing Instruction

A consumer electronics company is about to introduce a digital camera with a built-in MP3 function that can play a photo slideshow with background music.

Instruction:

Your job is to come up with a tagline to be used in a magazine ad for the general public.

The requirement is to highlight how the "background music" feature of the built-in MP3 player can enhance the digital camera's slideshow.

In the spaces provided below, please come up with tagline(s) fitting the above requirement.

____

____

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Katherine White & John Peloza

Self-Benefit Versus Other-Benefit Marketing Appeals: Their Effectiveness in Generating Charitable Support

Despite the growing need, nonprofit organization marketers have not yet fully delineated the most effective ways to position charitable appeals. Across five experiments, the authors test the prediction that other-benefit (self-benefit) appeals generate more favorable donation support than self-benefit (other-benefit) appeals in situations that heighten (versus minimize) public self-image concerns. Public accountability, a manipulation of public self-awareness, and individual differences in public self-consciousness all moderate the effect of appeal type on donor support. In particular, self-benefit appeals are more effective when consumers' responses are private in nature; in contrast, other-benefit appeals are more effective when consumers are publicly accountable for their responses. This effect is moderated by norm salience and is related to a desire to manage impressions by behaving in a manner consistent with normative expectations. The results have important managerial implications, suggesting that rather than simply relying on one type of marketing appeal across situations, marketers should tailor their marketing message to the situation or differentially activate public self-image concerns to match the appeal type.

Keywords: charity, self-benefit, other-benefit, altruism, egoism, public self-image, norms

> It is one of the most beautiful compensations of this life that no man can sincerely try and help another without helping himself.
>
> —Ralph Waldo Emerson

> If we give with the underlying motive of inflating the image others have of us,... we defile the act. In this instance, what we are practicing is not generosity but self-aggrandizement.
>
> —Dalai Lama

The self-serving benefits of helping others have long been recognized by those who promote and engage in prosocial behavior. The Emerson quotation suggests that even though people can help others, their underlying reasons for helping are often egoistic or self-serving. However, the Dalai Lama quotation suggests that people should help others for more altruistic, other-focused reasons. These different points of view highlight the two ways that marketers commonly appeal for charitable support—positioning charitable giving either egoistically (i.e., by highlighting the benefits for the donor) or altruistically (i.e., by highlighting the benefits for others). Following Fisher, Vandenbosch, and Antia (2008), we refer to the former as "self-benefit" appeals and define these as appeals that highlight that the main beneficiary of support is the donor. We refer to the latter as "other-benefit" appeals and define these as appeals that highlight that the main beneficiary of support is some other individual or organization.[1] This research investigates the conditions under which other-benefit (self-benefit) appeals are more effective than self-benefit (other-benefit) appeals in influencing donation intentions and behaviors by examining the moderating role of public self-image concerns.

Exploring the conditions under which people are inclined to donate to charity is becoming increasingly important (Bendapudi, Singh, and Bendapudi 1996; Reed, Aquino, and Levy 2007). Despite growing competition for resources, government assistance, and consumer support, charities continue to provide numerous vital services, ranging from health care to housing to disaster relief. Increased need for charitable support has necessitated that nonprofit organizations seek out the most effective ways to communicate their causes to consumers. Indeed, charities have adopted many of the sophisticated marketing techniques—

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[1] Self-benefit appeals can vary in terms of the types of benefits they offer. Sometimes self-benefits are tangible (e.g., a tax receipt or a gift), but sometimes they are more intangible (e.g., feeling good about oneself). We view appeals that promote any benefit to the donor as self-benefit appeals. It is also possible for charities to simultaneously highlight benefits to both the donor and the recipient. However, consistent with previous research, we separate the two appeal types to examine when each appeal is more effective than the other.

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relationship marketing, branding, and the measurement of marketing return on investment—previously considered the domain of their for-profit counterparts (Burnett 2002; Ives 2004). As such, marketing researchers have recently argued that the question of how nonprofit organizations should best request donor support is of critical importance (Reed, Aquino, and Levy 2007).

This research aims to answer this question by elucidating the conditions under which other-benefit appeals are more effective than self-benefit appeals in influencing donation intentions and behaviors. This is important because charities regularly use both appeal types. We conducted a small-scale pilot study, showing that in a random sample of 25 charities (*NonProfit Times* 2007) that presented appeals for donor support on their Web sites, both self- and other-benefit appeals were commonly used (13 charities used other-benefit appeals, 7 charities used self-benefit appeals, and 5 charities used a combination appeal). For example, Goodwill Industries provides an other-benefit appeal: "Your donations help fund job training and other career services that help people become successful at work." In a self-benefit appeal, Big Brothers Big Sisters of America states, "Being a 'Big Brother' or 'Big Sister' is one of the most rewarding and enjoyable things you will ever do." The American Lung Association uses a combination appeal: "Your gift sent by December 31 is tax-deductible. So please be especially generous in the spirit of the season to help fund vital research and urgently needed community programs to help fight lung disease. Thank you for giving the gift of help and hope."

This research makes several contributions to the marketing and charitable giving literature streams. First, we extend previous research that considers the role of demographic variables, such as gender, in determining people's inclinations to be self- or other-oriented (e.g., Brunel and Nelson 2000; Nelson et al. 2006), by demonstrating that variables that marketers can manipulate (e.g., public versus private nature of the donation setting) can influence the effectiveness of different appeals in encouraging donor support. Second, our work extends Reed, Aquino, and Levy's (2007) research that demonstrates the importance of the self in moderating reactions to how charitable appeals are positioned. While these researchers examined the role of moral self-identity in determining donation preferences, we consider a different impact of the self on donor support—namely, whether the desire to present a normatively approved self-identity to others moderates reactions to other-benefit and self-benefit appeals.

Third, while previous research has examined the role of contextual factors, such as the identity congruence of other donors, in garnering charitable support (e.g., Shang, Reed, and Croson 2008), the current work represents the first examination of the impact of a unique contextual factor—public self-image concerns—on the efficacy of appeal type. Public self-image concerns refer to the degree to which a person is motivated to present a positive self-image to others (e.g., male consumers are more likely to avoid the negative associations of a "ladies' cut of steak" when consumption occurs in public than when it occurs in private [White and Dahl 2006]). We test the novel prediction that the effectiveness of appeal type (i.e., other-benefit versus self-benefit) is moderated by the degree to which public self-image concerns are activated. More specifically, we propose that other-benefit appeals are more effective in encouraging donor support than self-benefit appeals when public self-image concerns are heightened. Conversely, we expect consumers to respond more positively to self-benefit appeals than to other-benefit appeals when public self-image concerns are minimized.

A fourth contribution of this research is that it extends prior work on public self-image concerns by demonstrating that such concerns do not always increase charitable support (e.g., Glazer and Konrad 1996; Satow 1975) but do so only under certain boundary conditions. Indeed, we anticipate that decreased donor support will be exhibited in response to self-benefit appeals when in public. This study also reconciles both research suggesting that consumers always donate in ways that make them appear altruistic (West 2004) and work showing that consumers uniformly react in ways that make them appear egoistic and self-interested (Holmes, Miller, and Lerner 2002). Furthermore, we test for the underlying role of public self-image concerns by examining public accountability, public self-awareness, and individual differences in public self-consciousness as moderators of the effect of appeal type on donor intentions. Finally, we elucidate the mechanism underlying our findings by examining the moderating role of norm salience and the mediational role of the desire to manage impressions by acting in a normatively approved way.

Self-Benefit Versus Other-Benefit Appeals for Charitable Support

Although there remains heated debate regarding whether charitable giving and helping others in general is motivated purely by altruism (e.g., Batson 1990; Dovidio, Allen, and Schroeder 1990) or by more self-serving motives (Cialdini et al. 1997), both other-benefit and self-benefit appeals are commonly studied by marketing researchers and used by charitable organizations (e.g., Bendapudi, Singh, and Bendapudi 1996; Brunel and Nelson 2000; Fisher, Vandenbosch, and Antia 2008). We begin by reviewing evidence for the effectiveness of both self-benefit and other-benefit appeals in encouraging positive donation intentions and behaviors.

Some research suggests that self-benefit appeals are particularly successful in encouraging positive donor support. Social exchange theory, which is commonly used to explain the efficacy of self-benefit appeals, suggests that people invest in relationships on the basis of comparative levels of costs and rewards (Blau 1964). Researchers have noted the usefulness of social exchange as a model to explain marketing in general (Bagozzi 1975; Gundlach and Murphy 1993) and charitable contributions in particular (e.g., Mathur 1996; Watters 1995; Wilson 2000). Because social exchange theory suggests that consumers donate to charitable causes when the benefits outweigh the costs, self-benefit appeals (i.e., that state the individual self-benefits to be attained through charitable giving) should be particularly effective in increasing donation intentions because they highlight a favorable cost–benefit ratio.

Consistent with the notion that self-benefit appeals are more effective than other-benefit appeals in garnering donor support, Holmes, Miller, and Lerner (2002) demonstrate that contributions increase when donations of money are positioned egoistically as an exchange (versus more altruistically). They suggest that though people want to help others (e.g., by supporting charitable causes), they are often hesitant to do so unless they can justify to themselves and others that their behavior serves their own self-interest. This framework predicts that people react more positively to self-benefit than other-benefit appeals because highlighting self-benefits gives offers "psychological cover" (p. 145) for engaging in an altruistic act (i.e., people do not need to be constrained by a psychological contract that holds them to supporting all charitable groups or even the same charity in the future).

In contrast, in his seminal article on social marketing, Rothschild (1979) argues that the traditional marketing model of exchange is less relevant for noncommercial exchanges, such as donations. Other researchers further suggest that other-benefit appeals are more effective than self-benefit appeals in garnering donor support. For example, Pessemier, Bemmaor, and Hanssens (1977) find that organ donation intentions drop significantly when a self-benefit appeal in the form of a monetary incentive is added to an other-benefit appeal, suggesting that self-benefit appeals can sometimes lead to detrimental effects compared with more traditional, other-benefit appeals. Similarly, recent research by Fisher, Vandenbosch, and Antia (2008) reveals that donations to public television station funding drives are more positive in response to other-cêntred appeals than to self-benefit appeals. In summary, extant research supports the efficacy of both self-benefit and other-benefit appeals in encouraging positive donor support.

Public Self-Image Concerns

Impression management theory posits that, in general, people are motivated to make a favorable impression on others and to present themselves in a positive light (Goffman 1959; Leary and Kowalski 1990; Schlenker 1980). Indeed, consumers strategically adjust their behaviors to convey a positive public self-image by altering coupon usage decisions (Ashworth, Darke, and Schaller 2005), misrepresenting the amount paid for purchases (Sengupta, Dahl, and Gorn 2002), and avoiding products associated with dissociative out-groups (Berger and Heath 2007; White and Dahl 2006). In the domain of charitable giving, heightened public self-image concerns have been posited to lead to increased donor support (Glazer and Konrad 1996; Satow 1975).

However, we propose that heightened public self-image concerns do not uniformly increase donor support. We anticipate that consumers exhibit relatively more positive donation intentions and behaviors in response to other-benefit appeals than in response to self-benefit appeals when public self-image concerns are activated. We draw on Leary and Kowalski's (1995) two-factor model of impression management to make this prediction. The model proposes that impression management consists of both impression motivation (i.e., the degree to which the desire to control the self-image projected to others is activated; see also Wooten and Reed 2000) and impression construction (i.e., the selection of an appropriate impression to convey to others and how to convey that image). We suggest that factors that heighten public self-image concerns (i.e., public accountability, public self-awareness, and public self-consciousness) increase impression motivation. Furthermore, because donating for other-serving, altruistic (and not for self-serving, egoistic) reasons is normatively approved of (Berkowitz and Daniels 1964), these norms provide information regarding how the impression should be constructed. We define norms as values, attitudes, and behaviors that are approved of and expected by others (e.g., Fisher and Ackerman 1998). Thus, heightening public self-image concerns should activate impression motivation, and the relevant norm should provide information regarding how to engage in impression construction (i.e., by appearing to be more other-serving than self-serving). As a result, donor support will be more positive in response to other-benefit than self-benefit appeals when public self-image concerns are heightened. When public self-image concerns are minimized, the focus will be on the self (rather than social norms), and donor support will be more positive in response to self-benefit than other-benefit appeals.

Normative Expectations

Leary and Kowalski (1995) propose that a potential source of information used in impression construction is a target audience's expectations and values (i.e., norms), though they do not directly test this within their framework. Prior research has suggested that people consensually share the normative expectation that they should help for altruistic rather than egoistic reasons (Berkowitz and Daniels 1964; White 1984). It has been suggested that societal norms are behavioral standards that develop because they are of particular importance to the societal system (Barkow 1978). That is, the norm to help others for other-serving rather than self-serving reasons may have evolved because of society's need to balance more individual egoistic and hedonic motives with society's need for its members to offer help and assistance to others, without necessarily any reciprocal benefit to the self (White 1984).

Furthermore, research on charitable giving has also proposed that the societal norm is that a person should give for other-serving, altruistic reasons rather than for self-serving, egoistic reasons (Fisher, Vandenbosch, and Antia 2008; West 2004). In further support of our conceptualization, we conducted a pilot study that demonstrates that people hold a normative belief that it is more appropriate to engage in charitable support for other-focused (e.g., altruistic) than self-focused (e.g., egoistic) reasons. Undergraduate students (n = 28) responded to eight items (four on donating time and four on donating money) on a six-point continuum; higher (lower) scores indicated that donating for other-focused (self-focused) reasons was more socially approved of: "In general, others approve more of volunteering time/donating money with a charity when it is motivated by (more egoistic [self-serving] reasons/more altruistic [other-serving] reasons"; "In general, it is considered by society to be 'better' when one volunteers/donates money to achieve (more self-serving benefits/more other-serving benefits)"; "In general, society sanctions volunteering to/donations of money to (help oneself/help others)"; and "In general, others approve of volunteering to/donating money to (further one's own interests/help other people in need)." We averaged these items to create a normative belief scale ($\alpha = .74$). Participants reported that it was more normatively appropriate to engage in charitable support for other-focused than self-focused reasons (M = 5.23; one sample t-test against scale midpoint, $t(27) = 16.21, p < .001$).[2]

The Current Research

In summary, we predict that consumers will exhibit more positive donation intentions and behaviors in response to other-benefit than self-benefit appeals when public self-image concerns are heightened. Conversely, consumers are expected to respond more positively to self-benefit than other-benefit appeals when public self-image concerns are minimized. Although these predictions may appear to be intuitive, they are different from the predictions stemming from two conventionally held lines of wisdom. First, one widely held viewpoint suggests that helping in general is enhanced by increasing self-presentational concerns (Baumeister 1982; Glazer and Konrad 1996; Satow 1975). This view predicts that regardless of how the marketing appeal is positioned (i.e., other-benefit versus self-benefit), heightening public self-image concerns should enhance charitable giving. In contrast, the current framework anticipates increased donor support only in response to other-benefit appeals (and predicts decreased donor support in response to self-benefit appeals) when public self-image concerns are heightened. A second commonly held belief is that people should uniformly prefer self-benefit to other-benefit appeals and that this should be augmented when public self-image concerns are activated (e.g., Holmes, Miller, and Lerner 2002). Although this framework would predict a tendency to respond more positively to self-benefit than other-benefit appeals, our conceptualization predicts more positive responses to other-benefit than self-benefit appeals when public self-image concerns are activated. Such a distinction is of both practical and theoretical importance.

We examine the role of public self-image concerns in determining the effectiveness of appeal type by examining the moderating role of three variables that are novel to the domain of charitable giving. Within the context of each study, we highlight how public accountability (Studies 1 and 4), situational public self-consciousness (Study 2), and individual differences in public self-consciousness (Study 3) are all related to the underlying construct of public self-image, and we demonstrate that heightening concern with public self-image leads to more favorable responses to other-benefit appeals than to self-benefit appeals. Finally, we provide evidence that the mechanism underlying our effects is related to the desire to manage impressions by behaving in a normatively approved way. We demonstrate this by examining the meditational role of impression management (Study 4) and the moderating role of normative expectations (Study 5).

Study 1

People tend to be more concerned with impression management when they are in public than when they are in private settings (e.g., Leary and Kowalski 1990; Reis and Gruzen 1976) and when they are made publicly accountable (i.e., when they must discuss or explain their judgments or decisions in front of others; Lerner and Tetlock 1999). The public expression of views often leads to the motivation to conform to the audience's expectations and to manage the impressions made on others (Baumeister 1982; Leary and Kowalski 1990). Recent research suggests that consumers often are motivated to present a positive public self-image to others (Argo, White, and Dahl 2006) and that this tendency is heightened when evaluations and choices are made public (Ratner and Kahn 2002; White and Dahl 2006). Consistent with our theoretical framework, we anticipate that consumers will exhibit more positive intentions and behaviors in response to other-benefit than self-benefit appeals (i.e., the more normatively acceptable response) when their responses are made in a public setting. In private settings, people have more opportunity to consider the self-benefits of their donation and thus evaluate self-benefit appeals more positively than other-benefit appeals. We examine intentions to donate time (i.e., volunteer intentions) and predict that public accountability moderates the effectiveness of appeal type:

> H_1: Other-benefit appeals are more effective than self-benefit appeals in generating positive donation intentions when consumers are publicly accountable. Self-benefit appeals are more effective than other-benefit appeals when consumers are not publicly accountable.

Method

Participants were 144 undergraduate students (86 women and 58 men; mean age = 20.69 years) who were recruited through an undergraduate listserve and posters placed around campus to complete a paper-and-pencil questionnaire in exchange for payment. Participants were randomly assigned to one of four conditions in a 2 (appeal type: other-benefit versus self-benefit) × 2 (accountability: public versus private) between-subjects design. They were told that the study examined consumer reactions to charitable advertising. They took part in small groups of six to ten people seated around a large table in a conference room. Participants were asked to complete consent forms, were given verbal instructions by the experimenter, and then were handed questionnaire packages to complete.

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[2] We wanted to examine norms among the population of interest in this pretest, but we note that norms vary across different cultures, subcultures, and so on (Jain 1989). Furthermore, following the definition of norms, we asked participants to report society's expression of what is socially approved of, which may differ from their own attitudes per se.

We manipulated accountability at the beginning of the session. In the public condition, the experimenter told participants that their donation intentions would be made public (i.e., discussed with others), and they were reminded on the first page of the questionnaire package that they would be asked to discuss their responses "with the experimenter and any other participants in the room today" (see Lerner and Tetlock 1999; Tetlock, Skitka, and Boettger 1989). In the private condition, the experimenter verbally informed participants that their donation intentions would be private, and they were reminded on the first page of their questionnaire package that all their responses would be "anonymous and confidential."

Participants then viewed either the other-benefit or the self-benefit version of an advertisement requesting a donation of time for a local charity. We selected the charity, which provides food, shelter, and other services to the city's homeless, because pretesting indicated that respondents were familiar with the charity and evaluated it fairly positively. The other-benefit condition highlighted two altruistic benefits: "help those less fortunate" and "help make the community a better place for everyone." The self-benefit condition highlighted two egoistic benefits: "build your resume by developing and practicing job skills" and "enjoy networking opportunities and meet new people." We designed these appeals to replicate the appeals charities commonly employ (Clary et al. 1998), and we confirmed their effectiveness in a pretest. In particular, 33 participants evaluated the other- and self-benefit appeals ("To what degree is this an altruistic appeal [i.e., focused on helping others]?" "To what degree is this appeal associated with looking out for the interests of others?" "To what degree is this an egoistic appeal [i.e., focused on helping oneself]?" and "To what degree is this appeal associated with looking out for one's own interests?") on seven-point scales. We created indexes of perceived self-/other-benefits by reverse scoring the first two items and averaging the items for self ($\alpha = .85$) and other ($\alpha = .70$) appeals. Participants evaluated the self-benefit appeal as being significantly more focused on self-benefits than the other-benefit appeal (Ms = 5.49 and 2.75; $t(32) = 15.39, p < .001$).

In the study itself, participants completed a three-item measure of their intentions to donate time on seven-point scales: "How likely would you be to make a donation of time (i.e., volunteer) to The Mustard Seed?" " How inclined are you to volunteer with The Mustard Seed?" and "How willing are you to volunteer with The Mustard Seed?" ($\alpha = .91$). In addition, participants completed a manipulation check for accountability, and analysis confirmed that this was successful. At the end of the study, participants completed demographic measures (e.g., gender, age), were debriefed, and were probed for suspicion. None of the participants indicated that they were aware of the hypotheses in this or any of the studies. The demographic variables did not predict significant variance in the dependent variable (or interact with any other independent variable to predict the dependent variable). This was true across all studies (for all dependent measures and manipulation checks), so we do not discuss these measures any further.

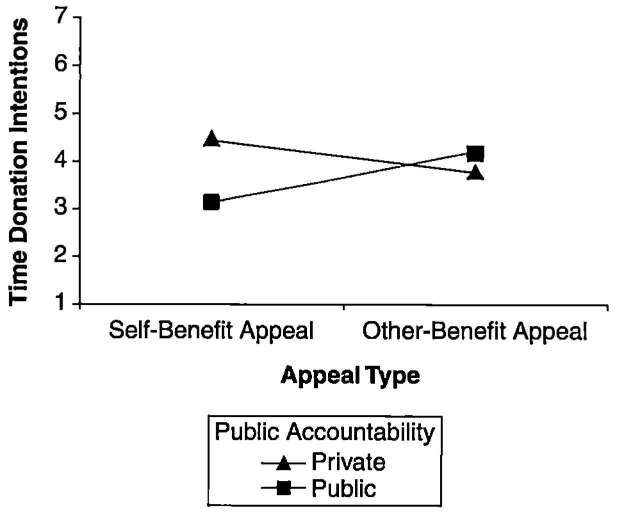
Results and Discussion

A 2 (appeal type: other-benefit versus self-benefit) × 2 (accountability: public versus private) analysis of variance (ANOVA) on donation intentions revealed a significant interaction ($F(1, 140) = 14.68, p < .001$; see Figure 1). As we predicted, when consumers were publicly accountable, they were more inclined to volunteer in response to the other-benefit (M = 4.22) than the self-benefit (M = 3.14) appeal ($t(140) = 3.27, p < .01$).[3] When intentions were private, people were more willing to donate time in response to the self-benefit (M = 4.45) than the other-benefit (M = 3.77) appeal ($t(140) = 2.13, p < .05$). The self-benefit appeal led to significantly fewer positive donation intentions when responses were to be public than when they were to be private ($t(140) = 3.90, p < .001$). The other-benefit appeal did not lead to significantly more negative donation intentions when respondents were privately rather than publicly accountable ($t(140) = 1.45, p > .15$). The main effects for both appeal type ($F(1, 140) = .01$, not significant [n.s.]) and accountability ($F(1, 140) = 1.01$, n.s.) did not reach significance.

As we anticipated, other-benefit appeals generated more positive donation intentions than self-benefit appeals when donation intentions were public in nature. Self-benefit

FIGURE 1

Study 1: Other-Benefit (Self-Benefit) Appeals Are More Effective Than Self-Benefit (Other-Benefit) Appeals in Encouraging Positive Donation Intentions Under Conditions of Public (Private) Accountability



Notes: The dependent measure was time donation intentions rated on a scale ranging from 1 to 7.

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[3] The effects hold when we use group size as a covariate. This was true across all the studies. Although we might expect increases in group size to heighten public self-image concerns, it may be that there was not enough variance in group size to influence responses, given that group size varied only from six to ten participants in the studies.

appeals led to more positive donation intentions than other-benefit appeals in private settings, in which donors' intentions were not publicly expressed. Note that using the wrong type of appeal in certain settings can impair donation intentions, particularly with self-benefit appeals. Consumers responded significantly less positively to the self-benefit appeals when their donation intentions were public than when they were private.

Study 2

In Study 2, we demonstrate the conditions under which consumers have more positive donation intentions toward other-benefit than self-benefit appeals, even when donation intentions are private. We do so by examining the moderating role of a public self-awareness manipulation. Research argues that there are two distinct ways that self-focused attention can manifest itself—public self-awareness and private self-awareness (Buss 1980; Carver and Scheier 1981). We define public self-awareness as the tendency to become aware of the overtly observable, publicly displayed aspects of the self (i.e., a person's awareness that he or she is the object of an external observer; Orive 1984). For example, public self-awareness is often manipulated by informing participants that they will be videotaped (e.g., Hass 1984). Private self-awareness refers to the tendency to become aware of the private, internal aspects of the self (Carver and Scheier 1981). Public self-awareness manipulations lead people to be more concerned with their publicly displayed self-aspects and to conform to social expectations (Froming, Walker, and Lopyan 1982; Orive 1984; Scheier and Carver 1980).

We examine the prediction that pubic self-awareness moderates the effect of appeal type on donation intentions for two reasons. First, this enables us to provide a richer conceptualization of the underlying construct that public accountability presumably taps into—namely, public self-image concerns. Second, we want to examine the conditions under which consumers respond more positively to other-benefit (versus self-benefit) appeals for charitable support even when their donation intentions are private. It seems likely that even when responding in private, consumers who are publicly self-aware will respond in ways that are normatively approved of and that allow them to present themselves in a positive light. We predict the following:

> H_2: Under conditions in which donation intentions are private, other-benefit appeals are more effective than self-benefit appeals in generating positive time donation intentions when consumers are high in public self-awareness, whereas self-benefit appeals are more effective than other-benefit appeals when consumers are low in public self-awareness.

Method

Ninety-six undergraduate students (60 women and 36 men; mean age = 20.74 years) took part in this study in return for course credit. The study used a 2 (appeal type: other-benefit versus self-benefit) × 2 (public self-awareness: low versus high) between-subjects experimental design. Participants were recruited through their introductory marketing class and received a bonus credit for taking part. As in Study 1, participants took part in small groups seated around a large table in a conference room.

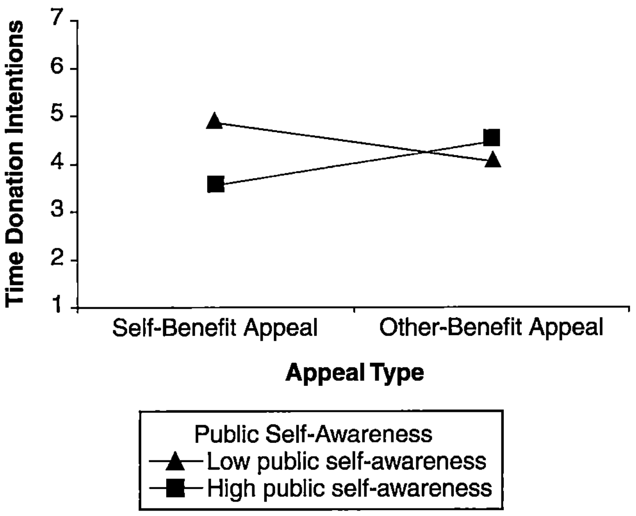
Participants were assigned to either the low- or the high-public-self-awareness condition (see Hass 1984; Orive 1984). In both conditions, a video camera was present in the room. Participants in the high-public-self-awareness condition were told that the researcher was going to be giving a presentation and wanted to record some people taking part in the research. The research assistant pointed the camera toward the participants and then assured them that it was turned on. In the low-public-self-awareness condition, participants were told that the camera was booked for the next person who would be using the room. In this condition, participants were assured that they would not be videotaped, and the camera was turned away from them. As in Study 1, participants then viewed either the other-benefit or the self-benefit version of the charity advertisement and reported their volunteer intentions ($\alpha = .92$). Participants completed manipulation checks for both appeal type and public self-awareness, and analysis showed that these were successful.

Results and Discussion

An ANOVA revealed a significant two-way interaction between appeal type and public self-awareness predicting volunteer intentions ($F(1, 92) = 7.53$, $p < .01$). As we predicted, participants high in public self-awareness reported significantly more positive volunteer intentions in response to the other-benefit ($M = 4.44$) than the self-benefit ($M = 3.54$) appeal ($t(92) = 2.00$, $p < .05$; see Figure 2). When self-awareness was low, participants exhibited a nonsignifi-

FIGURE 2

Study 2: Other-Benefit (Self-Benefit) Appeals Are More Effective Than Self-Benefit (Other-Benefit) Appeals in Encouraging Positive Donation Intentions Among Consumers High (Low) in Situational Public Self-Awareness



Notes: The dependent measure was time donation intentions rated on a scale ranging from 1 to 7.

cant trend toward more positive time donation intentions in response to the self-benefit (M = 4.85) than the other-benefit (M = 4.05) appeal (t(92) = 1.91, $p < .06$). Volunteer intentions were significantly more negative in response to the self-benefit appeal when the participant was high rather than low in public self-awareness (t(92) = 3.13, $p < .01$). Intentions in response to other-benefit appeals did not differ when participants were low versus high in public self-awareness. The main effects for appeal type (F(1, 92) = .03, n.s.) and public self-awareness (F(1, 92) = .90, n.s.) were not significant.

Study 2 found that consumers reported more positive time donation intentions in response to other-benefit than self-benefit appeals when public self-image concerns were heightened—in this case, when consumers were high in public self-awareness. When public self-image concerns were not heightened (i.e., consumers were low in public self-awareness), consumers demonstrated a trend toward more positive volunteer intentions in response to self-benefit appeals than to other-benefit appeals. This study also shows that even when donation intentions and behaviors are private, activating public self-image concerns can lead consumers to behave in ways that make them appear more altruistic and other-serving.

Study 3

Study 3 further tests whether consumer reactions to other-benefit versus self-benefit appeals are influenced by public self-image concerns by examining the moderating role of public self-consciousness. Research suggests not only that situational factors can influence people's tendency to focus attention inward or outward but also that there are individual differences in the tendency to focus internally on the self or the external social environment (Scheier and Carver 1980). Scheier and Carver (1985, p. 687) refer to the propensity to focus on the public self as public self-consciousness, and they define it as the "tendency to think about those self-aspects that are matters of public display" and to be concerned with the "qualities of the self from which impressions are formed in other people's eyes." A potential alternative explanation for the results in the preceding studies is that public accountability and public self-awareness simply increased participants' focus on others (e.g., the manipulations made people more likely to empathize with others), and this external focus, rather than concerns with public self-image per se, led participants to respond more favorably to other-benefit than self-benefit appeals under these conditions. The individual difference measure of public self-consciousness more directly taps into public self-image concerns (e.g., "I usually worry about making a good impression," "I'm concerned about what other people think of me").

Prior research has found that public self-consciousness is related to the use of self-presentation tactics, such as self-handicapping (Shepperd and Arkin 1989), avoiding products associated with dissociative reference groups (White and Dahl 2006), and lying about purchases (Sengupta, Dahl, and Gorn 2002). We propose that because the tendency to respond more positively to other-benefit than self-benefit appeals is based on public self-image concerns, people high in public self-consciousness will have more positive reactions to self-benefit than other-benefit appeals for charitable support. Based on findings from prior research, these effects should emerge only when participants' donation intentions are also public (e.g., Scheier and Carver 1980; White and Dahl 2006). Thus:

> H_3: Other-benefit appeals are more effective than self-benefit appeals in generating positive time donation intentions among consumers high in public self-consciousness when they are in public (versus private), but this effect is eliminated among consumers low in public self-consciousness.

Thus, Study 3 enables us to test the conditions under which public accountability does not lead to more positive evaluations of other-benefit than self-benefit appeals. We do not predict a preference for self- versus other-benefit appeals under conditions of public accountability for consumers low in public self-consciousness. These consumers may exhibit more positive donation intentions in response to self-benefit (versus other-benefit) appeals in both public and private contexts because they are not highly concerned with public self-image. One alternative explanation for the effects is that when in public, people high in public self-consciousness find processing more fluent when the advertisement is other-serving than when it is self-serving (Lee and Aaker 2004), perhaps because there is a "match" between a public focus and an other-benefit appeal. Another possibility is that when in public, people high in public self-consciousness find other-benefit appeals to be stronger arguments. Indeed, people are more likely to be persuaded when the argument quality is strong than when it is weak (Cacioppo, Petty, and Morris 1983). Finally, it is possible that in public, people high in public self-consciousness will report higher message involvement with self-benefit than other-benefit appeals. Thus, we test for these alternatives.

Method

One hundred sixty undergraduate students (86 women and 73 men [1 is not reported]) took part in return for course credit. This study used a 2 (appeal type: other-benefit versus self-benefit) × 2 (accountability: publics versus private) × 2 (public self-consciousness: low versus high) between-subjects design. Participants received bonus credit in their introductory marketing class for taking part. They participated in small groups and were assigned to either the public or the private accountability condition following a procedure similar to what we outlined in Study 1, with the exception that they were told that the number of hours they would commit to donating would be public in the public accountability condition. Participants then viewed either the other-benefit or the self-benefit appeal (as in Study 1) and completed an alternative measure to assess their willingness to donate time to the charity—they indicated how many hours per month they would agree to donate to the charity. To test for fluency, participants completed measures of processing fluency ("difficult to process/easy to process," "difficult to understand/easy to understand," and "difficult to comprehend/easy to comprehend"; $\alpha = .85$), message involvement ("not at all involved/very involved," "skimmed it quickly/

read it carefully," and "paid little attention/paid a lot of attention"; $\alpha = .85$; Lee and Aaker 2004), and perceived message strength ("How strong were the arguments?" "How compelling was the information given?" and "How persuasive was the information?"; all items were assessed on seven-point scales [$\alpha = .88$; see, e.g., Wheeler, Petty, and Bizer 2005]). After completing a series of filler items, participants completed the measure of public self-consciousness ($\alpha = .81$; Scheier and Carver 1985). As in the previous studies, we included manipulation checks for accountability and appeal type, and they were successful.

Results and Discussion

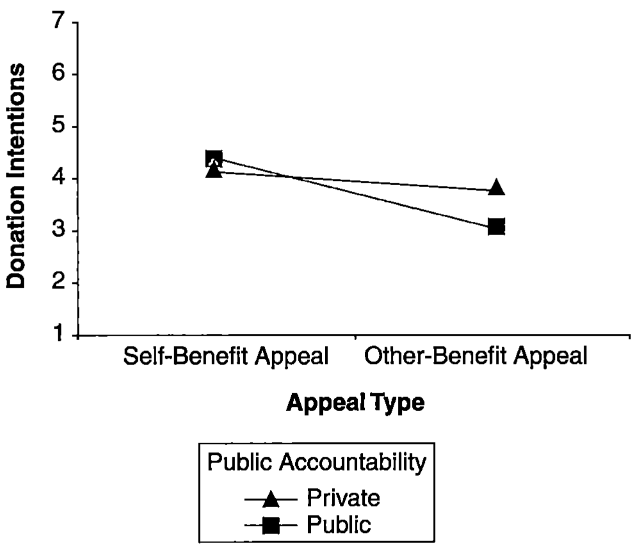
To examine the effect of the three-way interaction among appeal type, accountability, and public self-consciousness on volunteer time, we used regression analysis. When we entered the three-way interaction term, the lower-order interaction terms, and the main effects into the analysis, the three-way interaction significantly predicted volunteer time ($t(152) = 2.06$, $p < .05$; $\beta = .18$). When we selected for participants who were publicly accountable, the interaction between appeal type and public self-consciousness significantly predicted volunteer time ($t(76) = 2.34$, $p < .05$; $\beta = .27$). When we selected for participants who were not publicly accountable (i.e., private condition), the interaction between appeal type and public self-consciousness did not significantly predict volunteer time ($t(76) = .42$, n.s.; $\beta = -.05$).[4]

To examine the effects better, we calculated a median split on the public self-consciousness index. An ANOVA also revealed a significant three-way interaction ($F(1, 152) = 4.86$, $p < .05$). As we predicted, when participants were held publicly accountable, those high in public self-consciousness were willing to volunteer significantly more hours in response to the other-benefit ($M = 5.00$) than the self-benefit ($M = 3.35$) appeal ($t(152) = 2.14$, $p < .05$; see Figure 3). When publicly accountable, participants low in public self-consciousness were willing to volunteer fewer hours in response to the other-benefit ($M = 3.05$) than the self-benefit ($M = 4.38$) appeal ($t(152) = 1.99$, $p < .05$). When in private, those high in public self-consciousness did not exhibit differential willingness to volunteer in response to the other-benefit ($M = 3.21$) versus self-benefit ($M = 3.82$) appeal ($t(152) = .80$, n.s.). In private, participants low in public self-consciousness did not exhibit differential willingness to volunteer in response to the other-benefit ($M = 3.77$) versus the self-benefit ($M = 4.14$) appeal ($t(152) = .54$, n.s.).

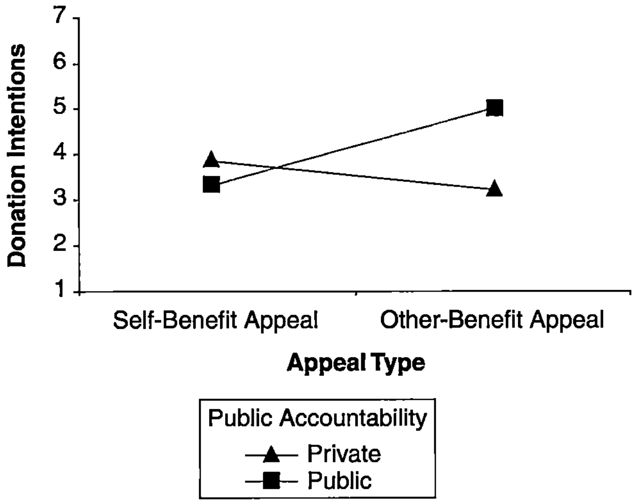
To test for rival hypotheses, we conducted a series of regression analyses. When we entered the three-way interaction term (appeal type, accountability, and public self-consciousness), the lower-order interaction terms, and the main effects into the regression predicting fluency, the three-way interaction did not significantly predict fluency ($t(152) = 1.60$, n.s.; $\beta = .12$). Similar analyses showed that the three-way interaction did not significantly predict message involvement ($t(152) = 1.30$, n.s.; $\beta = .11$) or argument

FIGURE 3
Study 3: Among Consumers High in Public Self-Consciousness, Other-Benefit (Self-Benefit) Appeals Are More Effective Than Self-Benefit (Other-Benefit) Appeals Under Conditions of Public (Private) Accountability

A: Low Public Self-Consciousness



B: High Public Self-Consciousness



Notes: The dependent measure was time donation intentions indexed by number of hours willing to volunteer with the charity.

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[4] The public self-consciousness measure assesses enduring individual differences (rather than situational variation) in public self-consciousness. Although participants completed the public self-consciousness scale after the manipulations, public accountability, appeal type, and their interaction did not predict any significant variance in public self-consciousness.

strength ($t(125) = .99$, n.s.; $\beta = .08$). Similar nonsignificant results emerged when we selected for participants in the publicly accountable condition and examined the interactions between appeal type and public self-consciousness. When we used a different approach to the data, the three-way interaction among appeal type, accountability, and public self-consciousness remained significant when we included fluency as a covariate ($F(1, 151) = 5.48$, $p < .05$), message involvement as a covariate ($F(1, 151) = 5.59$, $p < .05$), and argument strength as a covariate ($F(1, 151) = 6.00$, $p < .05$). Thus, these alternative constructs do not readily account for our findings.

The results of Study 3 reveal that participants reported greater willingness to volunteer time in response to the other-benefit than the self-benefit appeal when public self-image concerns were heightened (i.e., when the consumer was high in public self-consciousness and was publicly accountable). Conversely, when participants were low in public self-consciousness, they exhibited greater willingness to volunteer time in response to the self-benefit than the other-benefit appeal when publicly accountable. These differences were eliminated in the private condition. The results support the notion that the effects are related to public self-image concerns but that differences in cognitive processing do not readily account for the effects.

Note that participants low in public self-consciousness demonstrated a significant preference for the self-benefit over the other-benefit appeals when in public. Rather than being unaffected by the public accountability manipulation, participants low in public self-consciousness behaved in a manner incongruent with normative expectations. It may be that public accountability cues people to behave in certain ways. For people high in public self-consciousness, public accountability may cue them to behave in ways that are normatively approved of and that allow them to present a positive self-image to others. People low in public self-consciousness are less concerned with how their behaviors are viewed by others. For them, public accountability serves as a reminder that they do not want to behave in normatively approved ways and enhances their preference for self-benefit over other-benefit appeals.

Study 4

Study 4 uses a sample other than undergraduate students to increase the generalizability of the findings. We also broaden our investigation by examining actual donations of money using a more involved methodology. Participants viewed two advertisements from two related charities—one that highlighted self-benefits and one that highlighted other-benefits. Participants were given the opportunity to make a donation allocation in which they could contribute to one of the charities, to both of the charities, or to neither of the charities. Consistent with H_1, we predict that monetary donations will be higher in response to other-benefit than self-benefit appeals when participants are publicly accountable. Conversely, monetary donations will be higher in response to self-benefit than other-benefit appeals when consumers are not publicly accountable. In addition, participants completed items to assess the proposed mechanism underlying the effects—the desire to manage impressions by engaging in the normatively approved response. Formally, we predicted the following:

> H_4: The effect of public accountability on monetary donations to self-benefit versus other-benefit positioned charities is mediated, at least in part, by impression management.

Method

Participants were 79 members of a community and recreation association who completed a paper-and-pencil questionnaire. Participants were recruited through advertising in a local community newsletter, and the sample was largely representative of the community. Participants were paid $5 for participation in the study.

We used a 2 (appeal type: other-benefit versus self-benefit) × 2 (accountability: public versus private) mixed-model design, with appeal type as the within-subjects factor. Participants completed questionnaires in small groups of six to nine people in a community hall. We manipulated appeal type on a within-subjects basis by having participants view both an other-benefit and a self-benefit appeal. We chose two local charities working in cancer research and support because of their broad appeal and because pretesting indicated that participants had an equal likelihood to donate to either charity. The use of two related charities working in the same area allowed for consistency across the advertisements. Each advertisement promoted a new spring fundraising drive, and the peripheral arguments in the advertisements were held constant (i.e., need for support for research, patient care and education, and cancer prevention). The difference between the appeals was a summary benefit statement (other-benefit: "Just imagine how your donation will enhance the lives of those affected by cancer"; self-benefit: "Just imagine how your donation will enhance your life and make you feel"). We counterbalanced the order of appeal type and which charity was associated with which appeal. We manipulated accountability similarly to Study 1, with the exception that participants were told that their donation allocations would be made public in the public condition.

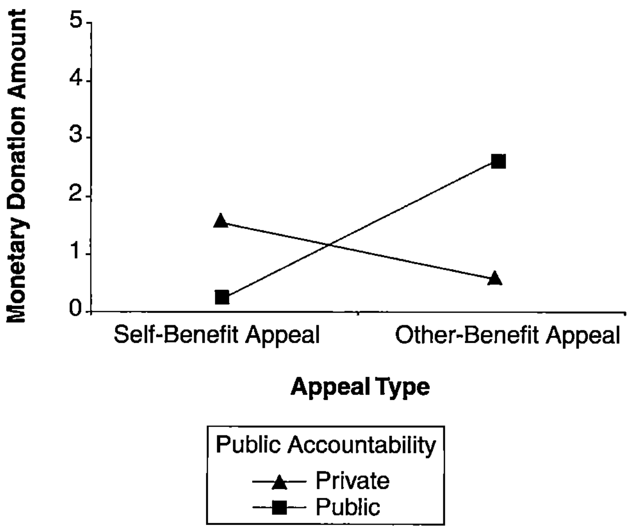
The dependent measure was donation allocation to each of the charities. Participants could use their $5 payment to support one of the charities or to support both charities, or they could keep the money for themselves (or any combination therein). In addition, participants completed items to assess the degree to which they were motivated to manage impressions by behaving in a normatively approved way (see the Appendix). We averaged these items to create an impression management index ($\alpha = .94$). Participants completed manipulation checks for accountability and appeal type, and these were successful.

Results and Discussion

Because participants could allocate money to the charity promoted with an other-benefit appeal and to the charity promoted with a self-benefit appeal, we included appeal type as a within-subjects measure. A mixed-model ANOVA revealed the predicted appeal type × accountability interaction (F(1, 77) = 38.85, $p < .001$). When participants believed that their donation behavior would be public, they donated significantly more money to the charity promoted with an other-benefit (M = 2.60) than to the charity promoted with a self-benefit (M = .26) appeal (t(77) = 6.34, $p < .001$; see Figure 4). Moreover, when participants believed that their donation allocations would be private, this finding was reversed such that more money was donated in response to the self-benefit (M = 1.52) than the other-benefit (M = .59) appeal (t(77) = 2.45, $p < .001$). Significantly less money was donated in response to the self-benefit appeal when participants were publicly accountable than when they were privately accountable (t(77) = 3.35, $p < .001$). Less money was donated in response to the other-benefit appeal when participants were privately accountable than when they were publicly accountable (t(77) = 5.35, $p < .001$). A notable finding was that two respondents donated more than $5. In support of our conceptualization, they donated more in the public condition ($10) to the charity promoted with the altruistic appeal (and no money to the charity promoted with the egoistic appeal). When we removed these two cases from the analysis, the effects still held (F(1, 69) = 38.83, $p < .001$).

Next, we examined the mediational role of impression management. Because donation allocation in response to the self-benefit versus the other-benefit was a within-subjects measure, we computed a donation allocation index by creating a difference score (i.e., the donation amount in response to the self-benefit appeal less the donation amount in response to the other-benefit appeal, as outlined by Judd, Kenny, and McClelland [2001]; see also White and Dahl 2006). According to Judd, Kenny, and McClelland (2001), three conditions must be met to demonstrate mediation. First, the independent variable must predict the outcome variable. Second, the independent variable must also predict changes in the proposed mediator. Third, the mediator must be shown to account for a significant portion of the relationship between the treatment and the outcome. Linear regression analysis revealed that public accountability significantly predicted the donation allocation index (t(77) = 6.23, $p < .001$; $\beta = .58$). Furthermore, public accountability significantly predicted the proposed mediator, impression management (t(77) = 2.96, $p < .001$; $\beta = .32$). When we included the impression management index in the regression equation predicting the donation allocation index along with public accountability, impression management was a significant predictor of the donation allocation index (t(77) = 3.33, $p < .001$; $\beta = .31$). Finally, although public accountability continued to predict the donation allocation index (t(77) = 5.22, $p < .001$; $\beta = .48$), a Sobel's test confirmed that the indirect effect of public accountability on donation allocations through the mediator of impression management was significant (z = 2.97, $p < .01$) (Baron and Kenny 1986; Sobel 1982). Thus, impression management partially mediated the relationship between public accountability and donation allocations in response to self-benefit versus other-benefit appeals. When we included counterbalancing in the regression analysis (and in the ANOVA), no significant main effects or interactions for order emerged.

FIGURE 4
Study 4: Other-Benefit (Self-Benefit) Appeals Are More Effective Than Self-Benefit (Other-Benefit) Appeals in Encouraging Monetary Donation Under Conditions of Public (Private) Accountability



Notes: The dependent measure was monetary donation (ranging from $0 to $5 between the two charities).

In the context of actual monetary donations, consumers allocated more to the charity promoted with an other-benefit appeal than to the charity promoted with a self-benefit appeal when donations were public. Consumers allocated more money to the charity promoted with a self-benefit appeal than to the charity promoted with an other-benefit appeal when donations were private. The results suggest that our findings are motivated, at least in part, by the desire to manage impressions by engaging in the normatively approved response.

Given that we manipulated appeal type within subjects, a potential alternative explanation for our effects might be that of a demand characteristic. That is, the nature of the experimental manipulation might have been such that participants determined what our key hypothesis was and behaved accordingly. However, we believe that this is an unlikely explanation for the findings. First, demand is unlikely to account for our effects, because the findings involve an interaction. It is difficult for participants to intuit and behave consistently with an interaction pattern (e.g., Pelham and Blanton 2003). Second, we included a post-experimental suspicion probe that confirmed that none of the participants correctly identified our hypothesis.

Study 5

In Study 5, we attempt to further delineate the mechanism underlying our effects. Our conceptualization suggests that heightening public self-image concerns should activate impression motivation, and relevant norms should provide people with information regarding how to engage in impression construction. We propose that in most situations, the accessible norm is that it is more appropriate to help others for other-focused than self-focused reasons (as our pilot study confirmed). An additional prediction that follows from our framework is that by making an alternative norm salient (e.g., Kallgren, Reno, and Cialdini 2000), our pattern of results should be reversed. That is, consumers should demonstrate more positive donation intentions in response to the self-benefit than the other-benefit appeal if the salient norm highlights that people should donate to charity for more self-serving reasons and if the appeal is made under conditions of public accountability. We manipulated which norm was salient (benefiting the self or benefiting others), manipulated public accountability, and examined volunteer intentions in response to self-benefit versus other-benefit appeals. Thus:

> H_5: Other-benefit appeals are more effective than self-benefit appeals in generating positive volunteerism intentions when consumers are publicly accountable and when an other-benefit norm is made salient. Conversely, self-benefit appeals are more effective than other-benefit appeals when consumers are publicly accountable and when a self-benefit norm is made salient.

In private, norm salience should not be as influential on consumer volunteer intentions, because impression motivation is low (Baumeister 1982) and people are less motivated to behave in the normatively approved way. As such, in private, participants should favor the self-benefit appeals over the other-benefit appeals, regardless of normative expectations.

Method

One hundred forty-two undergraduate students (71 women and 69 men [2 are not reported]) took part in return for course credit. We used a 2 (appeal type: other-benefit versus self-benefit) × 2 (accountability: public versus private) × 2 (normative expectations: other-benefit norm versus self-benefit norm) between-subjects experimental design. Participants were recruited through an introductory marketing class and received a bonus mark for taking part. They took part in small groups and were assigned to the public or private accountability condition. They were told that their donation intentions would be private and confidential in the private condition and that their donation intentions would be public (i.e., discussed with the researcher and the other participants in the room) in the public condition. Participants then read a brief scenario, the goal of which was to vary the normative approval of helping for self-serving versus other-serving reasons. In the other-benefit norm condition, the socially approved norm was to volunteer to help others, whereas in the self-benefit norm condition, the socially approved norm was to volunteer to garner benefits for the self (see the Appendix). We confirmed the effectiveness of this manipulation in a pretest. Fifty participants read the self-benefit or the other-benefit norm scenario and responded to six items on seven-point scales that assessed the normative approval of helping for self-serving (e.g., "To what degree does society expect that one volunteers to gain self-benefits?") or other-serving (e.g., "To what degree does society expect that one volunteers to benefit others?") reasons. We reversed-scored the other-serving items, and we averaged all items to create a normative expectation index ($\alpha = .97$). Participants rated helping for self-serving reasons as more normative in the self-benefit ($M = 5.65$) than the other-benefit ($M = 2.44$) condition ($t(48) = 9.09, p < .001$). As in Study 1, in the study itself, participants viewed the advertisement from a charity that depicted either the other-benefit appeal or the self-benefit appeal and then completed the volunteer intention items.

Results and Discussion

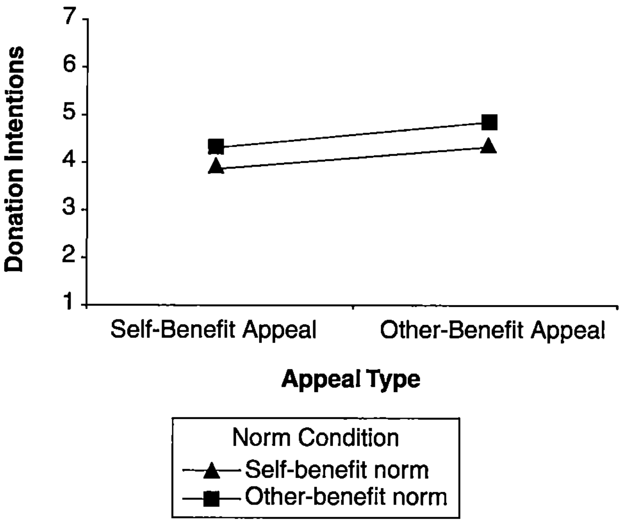
An ANOVA on volunteer intentions revealed the predicted interaction among appeal type, accountability, and normative expectations ($F(1, 134) = 5.34, p < .03$). In public, participants for whom the other-benefit norm was salient showed greater volunteer intentions in response to the other-benefit ($M = 4.67$) than the self-benefit ($M = 3.56$) appeal ($t(134) = 2.52, p < .05$; see Figure 5). When in public, participants for whom the self-benefit norm was salient showed greater volunteer intentions in response to the self-benefit ($M = 4.43$) than the other-benefit ($M = 3.33$) appeal ($t(134) = 2.62, p < .05$). In private, participants in the other-benefit norm condition did not show any significant differences between the other-benefit and the self-benefit appeals ($Ms = 4.85$ and 4.33; $t(134) = 1.02$, n.s.). In addition, when in private, participants in the self-benefit norm condition did not show any significant differences between the other-benefit and the self-benefit appeals ($Ms = 4.33$ and 3.87; $t(134) = 1.00$, n.s.).

The results revealed that the effectiveness of other-benefit and self-benefit appeals depends on norm salience and public accountability. Under conditions of public accountability, when the salient norm was that people should donate to charity for more self-serving (other-serving) reasons, participants exhibited more positive donation intentions in response to self-benefit (other-benefit) than other-benefit (self-benefit) appeals. This supports the notion that our effects are indeed related to a desire to manage impressions by engaging in the normatively approved response. We propose (and demonstrate in our pilot study) that it is common to hold the norm of helping for other-serving (versus self-serving) reasons. However, when helping for more self-serving reasons becomes salient, we find the reverse pattern of results.

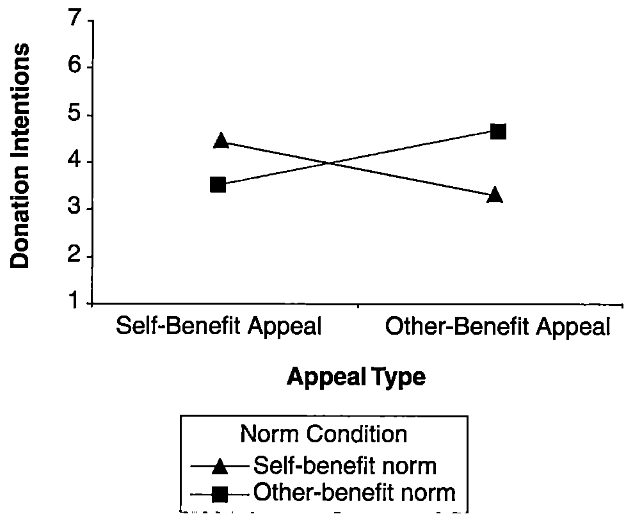
A counterintuitive finding was that in private, participants did not demonstrate more positive donation intentions in response to the self-benefit than the other-benefit appeals. A possibility for this is that the norm manipulation influenced participants in mixed ways under private conditions. Some participants (perhaps those particularly concerned with public self-image [e.g., those high in public self-consciousness]) may have been more inclined to behave in the normatively approved way, whereas others (perhaps those who were not concerned with self-image) may have been inclined to ignore or even react in a manner opposite to the normatively approved response. As a result,

FIGURE 5
Making Self-Benefit (Other-Benefit) Norms Salient Increases the Effectiveness of Self-Benefit (Other-Benefit) Appeals in Public (but Not in Private)

A: Private Accountability Condition



B: Public Accountability Condition



Notes: The dependent measure was time donation intentions rated on a scale ranging from 1 to 7.

when different normative expectations were made salient in private, participants did not exhibit predictable responses to other- and self-benefit appeals. It appears that though making a particular norm salient (and matching that norm with appeal type) may be effective under public conditions, doing so in private may not be efficacious.

General Discussion

Across five studies, we provide support for the notion that the efficacy of other-benefit versus self-benefit appeals is moderated by contextual characteristics and individual differences that heighten public self-image concerns. Other-benefit appeals were more effective than self-benefit appeals for encouraging positive volunteer intentions (Study 1) and monetary donations (Study 4) when consumers were publicly accountable for their responses. Conversely, self-benefit appeals appear to demonstrate greater effectiveness when consumers' responses are private. Study 2 shows that when participants were made publicly self-aware, they reported more positive time donation intentions in response to other-benefit than self-benefit appeals, even when volunteer intentions were private. Study 3 demonstrates that participants who were high in public self-consciousness and were publicly accountable exhibited greater willingness to donate time in response to other-benefit than self-benefit appeals.

Moreover, we demonstrate that the mechanism underlying our effects is related to the desire to manage impressions. Study 4 shows that our effects are due, at least in part, to a desire to manage impressions by behaving in normatively approved ways. Furthermore, Study 5 demonstrates that participants whose public self-image concerns were activated altered their donation intentions in response to other- and self-benefit appeals, depending on which norm was salient. Although participants tended to manage impressions by appearing other-serving when public self-image concerns were heightened (Studies 1–4), if they perceived behaving in a more self-serving manner as the norm, they instead managed their publicly displayed images by appearing more self-serving in public. No such differences emerged when donation intentions were private.

Theoretical Implications

The findings suggest that existing perceptions of what type of appeals are most effective in garnering donor support may be oversimplified. While some research argues for the effectiveness of other-benefit appeals across situations, other research argues for the effectiveness of self-benefit appeals. The current findings also challenge and expand on current views of how public self-image concerns are related to charitable giving. One point of view holds that, in general, helping is enhanced by increasing self-presentational concerns, regardless of the type of appeal the marketer uses (e.g., Satow 1975). A second belief is that people respond more positively to self-benefit than other-benefit appeals and that this should be augmented in public (Holmes, Miller, and Lerner 2002). Our research demonstrates that when public self-image concerns are heightened, consumers exhibit more positive donor responses to other-benefit than self-benefit appeals. Furthermore, when public self-image concerns are minimized, consumers show more positive donation responses to self-benefit than other-benefit appeals.

A notable theoretical implication of the current research is that it appears to reveal a different type of "psychological cover" than that which Holmes, Miller, and Lerner (2002) demonstrate. Holmes, Miller, and Lerner suggest (p. 145) that "the offer of an exchange permits people to still feel good about doing their part without committing themselves to a hard-to-live-up-to psychological contract." Thus, people often want to use an egoistic "cover" for donation because it helps them avoid the psychological burden of being committed to helping other charitable organizations or even the same charity in the future. That is, although other-benefit appeals are more normatively approved of (as demonstrated by the pilot study in the current research), self-benefit appeals may have the desirable quality of reducing internal conflict and the pressure to help in the future. Thus, a question for further research is how people resolve the conflict between the desire to present a positive self-image to others and the desire to manage their feelings of pressure and future commitment. A possibility implicated by the current work is that in public, other-benefit appeals are more effective because the former motivation (i.e., impression management) is paramount. In contrast, in private, self-benefit appeals are more effective because they help resolve psychological conflict. Although the donation requests in Holmes, Miller, and Lerner's research were public (each participant who was approached alone donated in front of the researcher), our manipulations arguably increased public self-image concerns to a greater extent.

Furthermore, Holmes, Miller, and Lerner (2002) find that the self-benefit appeal was more effective than the other-benefit appeal only under conditions that highlighted high need. Holmes, Miller, and Lerner's high-need condition described the "tragedy" for the victims and the severity of the situation. Our manipulations did not highlight degree of need per se. Focusing on a high degree of tragedy for victims can often result in defensive reactions among observers (e.g., Lerner 1980), and this may have led to a desire to use the psychological cover for engaging in an altruistic act, as Holmes, Miller, and Lerner suggest. A possibility for further research would be to examine the interplay between public self-image concerns (i.e., that can encourage more positive responses to other-benefit appeals) and degree of need (i.e., that can encourage positive responses to self-benefit appeals) in determining consumer reactions to different appeals. A final difference between the current research and Holmes, Miller, and Lerner's work is that our self-benefit appeal was made in the context of traditional charity donation, while theirs was in the context of a purchase of a good whose proceeds would be donated to charity. Positioning the appeal as a purchase may activate an exchange mind-set among consumers. Given that many charities now sell products, this type of appeal positioning warrants further research.

The results provide converging evidence that consumers show more positive donor support in response to other-benefit (self-benefit) than self-benefit (other-benefit) appeals when public self-image concerns are heightened (minimized). However, when examining the results across conditions in which a public versus private focus is activated, we find somewhat mixed results for the other-benefit appeals. For example, in Studies 1 and 2, participants responded more negatively to self-benefit appeals under conditions of public versus private accountability (and self-awareness), whereas intentions to donate in response to other-benefit appeals did not significantly differ across the private and public accountability (self-awareness) conditions. In Study 3, among participants high in public self-consciousness, self-benefit appeals were more effective under private (versus public) conditions, whereas other-benefit appeals were more effective under public (versus private) conditions. However, these differences did not emerge for participants low in public self-consciousness. In Study 4, public accountability had a significant, negative effect on the effectiveness of self-benefit appeals and a significant, positive effect on the effectiveness of other-benefit appeals. Finally, in Study 5, public accountability decreased (increased) the effectiveness of appeals that were inconsistent (consistent) with the helping norm, which we made salient. It appears that though helping for self-serving reasons is not a socially desirable motivation for helping (and, in general, is decreased in public versus private), a comparison of the findings for helping for other-serving reasons across public and private conditions yields more mixed results. It may be that other-benefit appeals are more effective only when comparing across public versus private conditions under circumstances in which public self-image concerns are most strongly activated. For example, we uncover more positive donation intentions in response to other-benefit appeals in public than in private in Study 3, but only among participants who are also high in public self-consciousness. Presumably, these are the conditions under which public image concerns are the strongest. (Indeed, given that Studies 1 and 2 likely contained participants both low and high in self-consciousness, this may explain the lack of differences across accountability conditions in those studies.) Likewise, publicly discussing actual donation allocation (rather than simply intentions) in Study 4 could have arguably led to particularly heightened public self-image concerns and, thus, more positive donations in response to other-benefit appeals in public versus private.

Implications for Practice

A question this research invokes is how the current results change existing perceptions and managerial practice. The theoretical implications we mentioned also provide important opportunities for nonprofit organizations to increase the efficacy of their marketing initiatives. In particular, the way the donation is requested should match the degree to which public self-image concerns are activated in a given context. If the donation response is private, marketers should use appeals that highlight the benefits the potential donor will obtain. Likewise, if the donation response is more public in nature, marketers should highlight the benefits to others. Indeed, charities often engage in relatively private (e.g., direct mail solicitations, appeals for donor support over the Internet) and relatively public (e.g., special events, personal fundraising) fundraising and recruitment activities simultaneously. Our results suggest that nonprofit marketers should not uniformly use one appeal across these different execution contexts but rather should tailor the appeal to effectively match the setting.

Furthermore, charities differ in their abilities to offer donor benefits in exchange for contributions. Younger charities or those with limited marketing budgets may lack the ability to offer anything more than a tax receipt, while better funded organizations can spend on lavish donor reward programs. Thus, appeal strategies should vary depending on the charity's capabilities—for example, charities limited to other-benefit appeals should pursue more public donation appeals rather than direct mail. Similarly, the ability to offer donor rewards varies across donation opportunities. Some volunteer positions offer more rewards for the donor than others. Volunteer positions on charity boards can offer donor skill development and networking opportunities, while activities such as envelope stuffing may hold fewer self-benefits. This research suggests that marketers should match their appeal strategies with their abilities to offer donor benefits, even when the mode of donation (e.g., volunteerism) remains constant.

Moreover, if the request is positioned as an other-benefit appeal, but must be made in private, Study 3 suggests that situational factors that increase focus on public self-image should be effective in encouraging charitable donation. For example, if a private donation is made in a larger group context (i.e., a large fundraiser), this may heighten public self-image concerns. Wooten and Reed (2000) suggest that self-presentational concerns should increase as a function of group size. Although group size did not moderate the effects in the current studies, we note that the sizes of the groups did not vary greatly and that substantially larger groups may heighten public self-image concerns, even when the donations are made in private. In addition, organizations that give consumers outwardly visable cues that signal to others that they have donated (e.g., "LIVESTRONG" wristbands for cancer support and research) might enhance this public focus and make other-benefit appeals more effective than self-benefit appeals, even if the donation occurs in private. This would be a worthwhile avenue for further research because though a gift is often viewed as being part of a self-benefit appeal, the "signaling" nature of such gifts might make consumers concerned with the image they portray to others (Berger and Heath 2007).

Given that norm salience moderates the effect of public self-image concerns on responses to self-benefit and other-benefit appeals, marketers should ensure a match between the salient norm and the appeal type in public settings. If the appeal is self-serving in nature and must be made in a public setting, marketers should activate the norm of giving for egoistic reasons. This could be done by providing background information to potential donors about what is normative (Aggarwal and Law 2005) or showing others engaging in the normatively approved behavior—in this case, helping others to get something in return (Kallgren, Reno, and Cialdini 2000). Our work, combined with other research, indicates that marketers need to be aware of the norms across a range of potential situations and target audiences and adjust appeal strategies accordingly. For example, Fisher and Dubé (2005) find that social norms of masculinity and power influence men's responses to emotional advertising when they are in the presence of other men. Thus, if the prevailing group norm is against action for other-serving reasons, marketers might want to execute public self-benefit appeals to capitalize on social desirability concerns.

Directions for Further Research

The current findings may have implications for domains much broader than charitable marketing. Indeed, many consumption behaviors, such as purchasing fair-trade products, choosing items not manufactured in sweatshops, and even reducing individual energy consumption, involve a degree of consideration for others. Further research could profitably examine the comparative effectiveness of self-benefit versus other-benefit appeals in encouraging other "helpful" consumer behaviors and whether public self-image concerns moderate consumer responses to such appeals.

The results suggest that though consumers respond more positively to other-benefit appeals than self-benefit appeals under conditions that heighten public self-image concerns, they likely want to appear more other-serving under these conditions rather than truly becoming more altruistic. Although self-benefit appeals are responded to more positively when direct benefits for the self are highlighted, other-benefit appeals are responded to more positively when the indirect benefit of positive self-presentation is heightened. Although this finding is beyond the scope of the current research, it adds to the debate regarding whether helping others in general can be motivated purely by altruism or by more egoistic, self-serving motives.

As we alluded to previously, charities may sometime use other-benefit and self-benefit appeals in combination. An additional direction for further research would be to examine the consequences of such a strategy. Does combining other-benefit with self-benefit appeals in a public setting lead to a positive response because consumers focus on the other-benefit message, or does such a strategy backfire given the inclusion of the self-benefit appeal? If the latter is the case, are their ways to attenuate consumers' negative donation responses?

Donor support is critical to the functioning of nonprofit organizations. Because these organizations make important contributions to society, research into factors that enhance charitable support is an important undertaking. As the quotations at the beginning of this article suggest, there are two key motives for helping—to benefit the self and to benefit others—and marketers often appeal to donors using these two types of appeals. This research demonstrates that both other-benefit and self-benefit appeals can be successful in influencing donation intentions but that their effectiveness depends on the degree to which public self-image concerns are relevant.

Appendix
Study Materials

Impression Management Items (Study 4)

- Because I care about how positively others view me.
- Because I want to present myself in a positive way.
- Because I want to make a positive impression on others.
- Because I want to make myself look good to others.
- Because I want to do what is expected of me.
- Because I want to do what other people think is right in this situation.

- Because I want to do what the norm is.
- Because I want to do what society believes is the right thing.
- Because I want to do what others approve of.

Normative Expectation Manipulation (Study 5)

Self-benefit norm. Imagine that you are looking for a summer volunteer position. A number of your friends also have part-time volunteer positions and the general agreement among your friends is that volunteering can help to develop some new skills to add to their resumes, as well as to make some valuable contacts. It is the consensus that volunteering is a good way to develop these much needed job skills and to meet and network with new people. Thus, the social expectation is that it is generally a good idea to volunteer to get ahead in your personal development. You start thinking about where you would like to volunteer and then you come across an advertisement from a local charity, the Mustard Seed. You then consider whether this might be the right place for you to volunteer at.

Other-benefit norm. Imagine that you are looking for a summer volunteer position. A number of your friends also have part-time volunteer positions and the general agreement among your friends is that volunteering can help others and make a difference in the community. It is the consensus that volunteering is a good way to make a contribution and to help other people. Thus, the social expectation is that it is generally a good idea to volunteer as a way to make a contribution to society. You start thinking about where you would like to volunteer and then you come across an advertisement from a local charity, the Mustard Seed. You then consider whether this might be the right place for you to volunteer at.

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Jianqing Chen, De Liu, & Andrew B. Whinston

Auctioning Keywords in Online Search

Keyword advertising, or "sponsored links" that appear alongside online search results or other online content, has grown into a multibillion-dollar market. Providers of keyword advertising, such as Google and Yahoo, profit by auctioning keywords to advertisers. An issue of increasing importance for advertising providers is the "share structure" problem—that is, of the total available resources for each keyword (in terms of exposure), how large a share should be set aside for the highest bidder, for the second-highest bidder, and so on. The authors study this problem under a general specification and characterize the optimal share structures that maximize advertising providers' revenues. They also derive results on how the optimal share structure should change with advertisers' price elasticity of demand for exposure, their valuation distribution, total resources, and minimum bids. The authors draw implications for keyword auctions and other applications.

Keywords: keyword advertising, share structures, search engine, divisible goods, sponsored links

Keyword advertising, also known as "sponsored links," is a form of targeted online advertising in which the placement of advertisements is triggered by keywords that users search or by keywords embedded in online content. Since its inception on search engines in the late 1990s, keyword advertising has quickly grown into a leading form of online advertising, accounting for 40% of today's online advertising market. A key success factor of keyword advertising is its ability to deliver the most relevant advertisements to online users. In addition, keyword advertising providers, such as Google and Yahoo, run real-time auctions for millions of different keywords, so even small marketers can afford to compete for exposures in their respective markets. eMarketer (2007) predicts that keyword advertising revenue will grow from $6.7 billion in 2007 to $16.9 billion in 2011.

The surge of keyword advertising has attracted attention from academic communities. Several researchers have examined the design of keyword auctions (e.g., Edelman, Ostrovsky, and Schwarz 2007; Liu, Chen, and Whinston 2009; Varian 2007) under the framework of "slot/position auctions," in which the highest advertiser gets the best slot, the second-highest advertiser gets the second-best slot, and so on. In contrast, we view resources for auctioning as the aggregate exposure that all available slots generate for a keyword phrase and propose that advertising providers can choose "share structures"—that is, how large a share of the total advertising resources should be set aside for the highest bidder (advertiser), for the second-highest bidder, and so on.[1] The focus of this article is to address the share structure problem in keyword auctions.

It is practical for advertising providers (including advertising networks and publishers) to manage share structures actively and communicate them to advertisers. To tailor the share of advertising resources allocated to an advertisement, advertising providers may randomize the allocation of the advertisement among available slots. For example, advertising providers can let two advertisers time-share a slot. An advertising network can also choose the number of Web sites on which to display an advertisement. To communicate the share structure to advertisers, advertising providers can provide estimated exposure for the highest bidder, the second-highest bidder, and so on, so that advertisers can bid accordingly.[2]

For several reasons, advertising providers should actively manage share structures rather than simply assign the first slot to the highest advertiser, the second slot to the second-highest advertiser, and so on.[3] First, for some key-

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[1] Different slots may generate different amounts of exposure. For example, empirical studies suggest that higher-ranked slots generate more exposure than lower-ranked ones on the same page (Pieters and Wedel 2004).

[2] Indeed, Google provides advertisers an estimated position along with the expected number of impressions in its Traffic Estimator tool. This tool can be used to communicate the share structures to advertisers before auctions because it provides sufficient information on how much exposure can be expected for being in a particular rank.

[3] Advertising providers do not publish details of their auctions. However, existing evidence suggests that they use the latter

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words, advertisers far outnumber the available slots. As a result, advertising providers may want to let multiple advertisers time-share a slot. Second, assigning the jth slot to the jth-highest advertiser may be a natural choice when there is a single Web site, but with the expansion of keyword advertising, advertising providers, such as Google and Yahoo, tend to have a large advertising network that offers many similar Web pages at the same time. Being in the top slots of all Web pages may be too much exposure for any single advertiser. Third, how advertising slots are located on a page is often up to the publishers. Slots may have no meaningful ranking (e.g., horizontally arranged slots may generate roughly the same exposure). In summary, many advantages exist for advertising providers to tailor the shares of advertising resources for advertisers of different ranks in the bidding outcome.

The issue of optimal share structures holds special importance for online advertising. Keyword auctions power both "sponsored search" (i.e., keyword advertisements that appear alongside search engine results) and "contextual advertisements" (i.e., keyword advertisements that appear alongside regular content). For example, Google uses keyword auctions to sell both sponsored search on its main search site and contextual advertisements on hundreds of thousands of Web sites in its advertising network. Keyword advertising providers also actively seek expansion of keyword auctions to other advertising formats, such as display and video advertising, and to other media, such as mobile devices, radio, and print advertising. Recently, Google acquired DoubleClick, a leading Internet display advertising provider, which has helped it expand beyond keyword advertising. Google allows advertisers to bid for placement of video advertisements on the popular video site YouTube. Both Google and Yahoo offer auction-powered print advertising services. As of March 2008, Yahoo's Newspaper Consortium comprised more than 600 newspapers. Google's Print Ads has enlisted more than 700 newspapers. As more advertising resources become available for auctions, it is of increasing importance for advertising providers to optimize share structures for these resources.

We use a game-theoretical framework to address the optimal share structure problem. To our knowledge, this article is the first to endogenize the share structure of online advertising auctions and to study its optimal design. We assume that the advertising provider can divide total advertising resources into multiple shares. Advertisers' valuation for a share is determined by the size of the share and a private valuation factor. Advertisers are invited to bid their willingness to pay per unit of resource (or unit price). The advertising provider allocates shares such that the advertiser that offers to pay the highest unit price receives the largest share, the advertiser who offers to pay the second-highest unit price receives the second-largest share, and so on. We use this model framework to identify factors that are relevant to the share structure design problem and derive managerial guidelines on how different factors affect the optimal share structure design.

This article makes a substantive contribution to the literature on keyword auction design. First, we characterize the optimal share structure in a general setting. We conclude that when advertisers' valuation is linear or convex in share size, a single grand share is optimal. When advertisers' valuation is sufficiently concave, multiple shares may become optimal. In general, the optimal share structure consists of a series of "plateaus," or consecutive shares of identical size. We find that the occurrence of plateaus is determined mainly by the distribution of advertisers' valuation factors.

Second, we offer insights into how the optimal share structure should change with several underlying demand or supply factors. We focus on how the steepness of the optimal share structure is affected by the following factors: advertisers' price elasticity, advertisers' valuation distribution, total resources, and minimum bids. A share structure is steeper if it has larger high-ranked shares and smaller low-ranked ones.

We define advertisers' price elasticity as the percentage of change in advertisers' demand for exposure resulting from a 1% change in price. We find that as advertisers' price elasticity decreases, the advertising provider should use a less steep share structure. When advertisers have near-perfect or perfect elastic demand, the advertising provider should use the steepest share structure, allocating as many resources as possible to the highest advertisers.

A change in advertisers' valuation distribution affects the optimal share structure in the following way: The optimal share structure should remain the same in the case of "scaling" (i.e., multiplying each advertiser's valuation factor by a common factor) and be less steep when the valuation distribution is "shifted" to the right (i.e., increasing each advertiser's valuation factor by a common factor).

When total resources increase, the absolute share sizes increase. However, changes in percentage values of shares depend on how advertisers' price elasticity of demand changes in total resources assigned to them. Top bidders should receive a larger percentage of the total resources when advertisers' price elasticity of demand increases in the amount of resources allocated. The converse is true when advertisers' price elasticity decreases.

We also show that the advertising provider should use a less steep share structure when imposing an optimally set minimum bid than when not imposing a minimum bid. Together, these results provide useful guidelines on how to manage share structures to fit specific market conditions.

We organize the rest of the article as follows: In the next section, we discuss the related literature. Then, we set forth our model and derive general results on optimal share structures. Following this, we discuss how the optimal share structure is affected by the underlying supply and demand factors. We then extend our analysis to a case with minimum bids. Finally, we summarize our conclusions, offer implications of our results, and suggest possibilities for further research.

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approach. For example, Google states, "Ads are positioned on search and content pages based on their Ad Rank. The ad with the highest Ad Rank appears in the first position, and so on down the page" (https://adwords.google.com/support/bin/answer.py?answer=6111). Yahoo and MSN similarly display higher-ranked advertisements in more favorable positions.

Related Literature

Marketing researchers have long recognized the importance of online advertising (Manchanda et al. 2006) and search (Bradlow and Schmittlein 2000). For example, Manchanda and colleagues (2006) empirically study the effect of banner advertising on purchasing patterns on the Internet. Wilbur and Zhu (2009) assess the problem of click fraud in pay-per-click search advertising and discuss how search engines' revenues are affected by such fraud. In addition, much research has been done on other types of Internet-based auctions, such as eBay auctions (Sinha and Greenleaf 2000), name-your-own-price auctions (Spann and Tellis 2006), and online reverse auctions (Jap 2007). However, keyword auctions differ from these types of auctions because in the latter, bidders often have unit demand for indivisible goods.

This article is most closely related to two literature streams. First, it is related to the stream of research on keyword auction designs. Prior research has examined online advertising auctions from several other perspectives. A few authors (Lahaie 2006; Liu and Chen 2006) have studied the unique weighted ranking rules that advertising providers use—that is, ranking advertisers by the product of their pay-per-click bids and their historical click-through rates (defined as the ratio of the number of clicks to the number of impressions). They find that such weighted ranking rules achieve efficiency in a unit price auction setting. Edelman, Ostrovsky, and Schwarz (2007) refer to keyword auctions as generalized second-price (GSP) auctions because an advertiser does not pay its own pay-per-click bid but rather the next highest one. Both Edelman, Ostrovsky, and Schwarz (2007) and Varian (2007) show that in GSP auctions, truthful bidding is not an equilibrium. Edelman, Ostrovsky, and Schwarz show that a GSP auction admits a set of "locally envy-free" equilibria that generate as least as much revenue as the Vickery–Clarke–Grove mechanism. Borgers and colleagues (2007) study GSP auctions under a more general specification and show that GSP auctions have multiple equilibria and that the efficient equilibrium that both Edelman, Ostrovsky, and Schwarz and Varian study may not be justified using simple equilibrium refinement. Both Varian (2007) and Borgers and colleagues (2007) also empirically investigate equilibrium bidding using early keyword auction data, but they reach different conclusions on the efficiency of these auctions. All these studies treat share structures as exogenously given. The current research complements these studies by examining advertising providers' share structure decisions.

Second, our research problem is related to the second stream of literature on the prize-allocation problem in contests. Kalra and Shi (2001) study prize allocation among salespeople and find that more prizes should be given as salespeople become more risk averse. Glazer and Hassin (1988) model contests as "all-pay" auctions or auctions in which bidders forfeit their bids whether they win or not. They find that winner-take-all is optimal when contestants' disutility is linear in their effort and skill is uniformly distributed. Moldovanu and Sela (2001, 2006) also show that winner-take-all is optimal as long as the disutility function is linear. Liu, Geng, and Whinston (2007) study prize allocation in promotional contests when the contest designer maximizes contestants' efforts rather than their outputs. Although prizes are allocated in a manner similar to the way shares are allocated, contests with convex disutility are structurally different from share auctions with concave valuation. In contests, the convexity of the disutility function affects contestants' preference for different prize structures indirectly through varying the costs of securing different-ranked prizes, whereas in share auctions, the concavity of the valuation function directly affects advertisers' preference for different share structures. Such a fundamental distinction enables us to characterize the optimal share structure for a more general n-share setting and to uncover the relationship between plateaus in the optimal share structures and the underlying valuation distribution. Moreover, we offer several new insights, including how advertisers' valuation distribution and total resources available affect optimal share structures.

Finally, this research also contributes to the literature on pricing capacity–constrained services (Rust and Chung 2006). Because of the perishable and capacity-constrained nature of advertising resources, they are similar to other capacity-constrained services, such as airline seats and hotel rooms (Desiraju and Shugan 1999), broadcast spots (Lodish 1980), and access services (Essegaier, Gupta, and Zhang 2002). However, prior literature on capacity-constrained services has focused exclusively on the posted prices rather than on auctions.

Research Model

Share Structure

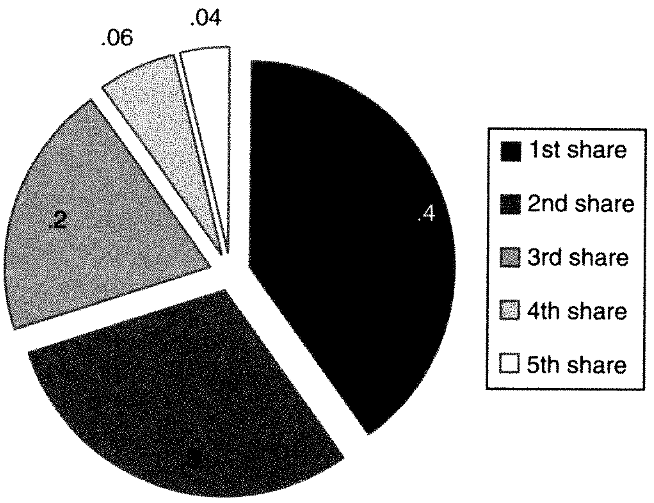
A risk-neutral advertising provider has an exogenous amount of advertising resources, with a normalized size 1. There are n risk-neutral advertisers, indexed by i = 1, 2, ..., n. The advertising provider prepackages total resources in as many as n shares, ranked from large to small. We use j to index shares. We denote s_j as the size of the jth share. We term the vector of share sizes, $s = (s_1, s_2, \ldots, s_n)$, as a share structure. Share structure s is feasible if it satisfies the following two conditions:

$$(1) \qquad s_1 \geq s_2 \geq \ldots \geq s_n \geq 0, \text{ and } \sum_{j=1}^{n} s_j \leq 1.$$

The first condition requires shares to be ordered in a nonincreasing way. The second condition requires the sum of shares not to exceed available resources. Figure 1 shows an example of a feasible share structure.

As we discussed previously, we consider advertising resources the total exposure generated by all available slots for a keyword phrase. Each share is part of the total available exposure. A slot/position auction (Lahaie 2006; Varian 2007) can be viewed as a special case of our model in which the first share provides the exposure generated by the first slot, the second share provides the exposure generated by the second slot, and so on. Thus, our model allows for a more flexible distribution of the total available exposure among bidders of different ranks.

FIGURE 1
An Example of a Share Structure



Advertisers' Valuation

We assume that advertiser i's valuation of a share is a function of a valuation factor (or the advertiser's type) v_i and the size of the share. Specifically, advertiser i's valuation for the jth share takes the following form:

$$u(v_i, s_j) = v_i Q(s_j), \tag{2}$$

where $Q(0) = 0$ and $Q'(\cdot) > 0$ (i.e., the valuation increases in the share size). Type v captures the difference in advertisers' valuation of resources. The valuation function $Q(\cdot)$ captures how advertisers' valuation changes in share sizes.

We assume that each advertiser's type is drawn from a common distribution F(v), $v \in [\underline{v}, \overline{v}]$. Each advertiser's type is private information, but the distribution F(v) is common knowledge. We assume that F(v) is twice differentiable, and its density function, f(v), is positive everywhere on $[\underline{v}, \overline{v}]$. In the keyword advertising setting, advertisers have different valuations for different reasons. First, all else being equal, users may click on one advertisement more frequently than on another, perhaps because of brand effects or simply because the former is more relevant. Second, even when users tend to click on two advertisements equally, advertisements may differ in their power to generate follow-up activities, such as purchasing or signing up.

Auction Format

The advertising provider uses a unit price auction to allocate all shares simultaneously. In particular, the advertising provider invites advertisers to bid on their willingness to pay per unit of resource, or the unit prices. The advertising provider ranks all bidders according to their unit prices and assigns the first share to the highest bidder, the second share to the second-highest bidder, and so on. We assume that advertisers pay for their assigned shares at the next highest prices. Such an assumption is supported by the prevailing practice among the leading online advertising providers. For example, Google uses a program called AdWords Discounter, which automatically reduces an advertiser's bid to the lowest possible price to keep its rank in the auctions. Yahoo has a similar policy.

The assumption that advertisers are ranked by their willingness to pay per unit of resource is consistent with actual auction formats used in keyword auctions. One popular auction format is pay-per-impression auctions, in which advertisers bid and are ranked by their willingness to pay per impression. For example, Google uses this auction format for contextual advertisements in its advertising network. Our model assumption is consistent with this format. Another popular auction format is weighted pay-per-click auctions (Liu, Chen, and Whinston 2009), in which advertisers bid on their willingness to pay per click but are ranked by the product of their willingness to pay per click and historical click-through rates. Google uses this format for its search-based advertising (sponsored search). Yahoo adopted a similar format in early 2007. If an advertiser's historical click-through rate is an unbiased estimator for the advertiser's future click-through rates, this approach essentially ranks advertisers by their expected willingness to pay per impression. Thus, our model assumption corresponds to this second format as well.[4]

Advertisers' Payoff

Each advertiser's expected payoff is the expected valuation less the expected payment to the advertising provider. In particular, if we denote $p_j(b)$ as the probability of winning the jth share by placing a bid of unit price b and if $\hat{b}(b)$ is the next highest bid, the expected payoff of an advertiser of type v is as follows:

$$U(v, b) = \sum_{j=1}^{n} p_j(b)\left[vQ(s_j) - \hat{b}(b)s_j\right]. \tag{3}$$

Advertising Provider's Revenue

The advertising provider's revenue is the sum of payments from all advertisers. Because the advertising provider does not know advertisers' types or their bids *ex ante*, the advertising provider's expected revenue is the expected payment from all advertisers:

$$\pi = nE\left[\hat{b}(b)\sum_{j=1}^{n} p_j(b)s_j\right]. \tag{4}$$

Game Timeline

The game proceeds as follows: The advertising provider announces a share structure $(s_1, s_2, \ldots, s_n)$. All advertisers privately learn their respective types and compete for shares by bidding their unit prices. The advertising provider then allocates the shares according to the ranking of the bids. An advertiser's problem is to maximize, for any announced share structure, the expected payoff (Equation 3) by choosing a unit price b. The advertising provider's problem is to maximize the expected revenue (Equation 4) by choosing a feasible share structure. The way to design the share structure from the advertising provider's perspective is the focus of this article.

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[4] Indeed, our model also applies to pay-per-action advertising (i.e., advertisers pay only when an online user undertakes a certain action, such as purchase or registration, after seeing the advertisement), as long as advertising providers rank advertisers by the product of their pay-per-action and action-to-impression rates (corresponds to click-through rates in pay-per-click advertising).

Given advertisers' valuation (Equation 2), we can also define advertisers' price elasticity. The price elasticity of advertisers' demand is the percentage of change in advertisers' demand resulting from a 1% change in price per unit of resource. Note that given price e, an advertiser should choose demand d to maximize the total payoff [vQ(d) – (e × d)] in a fixed-price setting. This enables us to calculate the advertiser's price elasticity of demand as follows:

$$\text{(5)} \qquad \text{Price elasticity} = -\frac{Q'(s)}{Q''(s)s}.$$

The shape of Q(·) determines advertisers' price elasticity. Specifically, an advertiser is perfectly price elastic if Q(·) is linear, and the advertiser's price elasticity decreases as Q(·) becomes more concave.

General Results on the Optimal Share Structure

In this section, we study the advertising provider's problem of choosing an optimal share structure. We assume that there is no minimum bid to focus on the impact of underlying supply and demand factors (subsequently, we relax this assumption). In what follows, we first derive some basic concepts and results under a simple linear valuation setting. We then use these concepts and results to examine the optimal share structures under more general valuation functions.

Equilibrium Revenue

Because we focus on the advertising provider's share structure problem, advertisers' equilibrium bidding function is not of particular concern here. Instead, we focus on the advertising provider's expected revenue. Using methods outlined in the auction literature (e.g., Klemperer 1999), we can derive the advertising provider's expected revenue π as the sum of expected payments from all advertisers (for details of this derivation, see the Web Appendix at http://www.marketingpower.com/jmjuly09):

$$\text{(6)} \qquad \pi = n\sum_{j=1}^{n} Q(s_j)\int_{\underline{v}}^{\overline{v}} P_j(v)\left[v - \frac{1-F(v)}{f(v)}\right]f(v)dv,$$

where

$$\text{(7)} \qquad P_j(v) \equiv \binom{n-1}{n-j}F(v)^{n-j}\left[1-F(v)\right]^{j-1}$$

is the equilibrium probability for an advertiser of type v to win the jth share.

We further denote J(v) ≡ v – [1 – F(v)]/f(v) as the marginal revenue of type v.[5] The term $Q(s_j)J(v)$ in Equation 6 represents a type-v advertiser's revenue contribution to the advertising provider when the advertiser is assigned to the jth share. The revenue contribution is less than the advertiser's valuation of the share, $Q(s_j)v$, except when $v = \overline{v}$. The difference reflects the advertiser's rent due to information asymmetry between advertisers and the advertising provider.

We further denote

$$\text{(8)} \qquad \alpha_j \equiv n\int_{\underline{v}}^{\overline{v}} P_j(v)J(v)f(v)dv,\ j = 1, 2, ..., n$$

and use the term α_j to refer to the return factor for the jth share. Note that $P_j(v)$ is the equilibrium probability of winning the jth share, so the return factor is the expected marginal revenue generated by winners of the jth share. Return factors reflect the difference in return rates for the same amount of resources allocated to different shares. Using this definition, we can rewrite the expected revenue (Equation 6) as follows:

$$\text{(9)} \qquad \pi = \sum_{j=1}^{n} \alpha_j Q(s_j).$$

The advertising provider's problem is to maximize Equation 9 subject to feasibility conditions in Equation 1. Intuitively, a share with a high return factor yields higher revenue for the advertising provider than a same-sized share with a low return factor. This implies that when possible, the advertising provider will allocate resources to shares with high return factors.

The relative magnitude of the return factors holds special importance in the optimal share structure problem. In general, the return factor of a share is determined by the distribution of types and the number of advertisers, but it is independent of the share structure s or the valuation function Q(·). Lemma 1 provides some insight into relative sizes of return factors.

A distribution satisfies the monotone-hazard-rate (MHR) condition if its hazard rate, f(v)/[1 – F(v)], monotonically increases within its support. The MHR property is satisfied by most single-peaked distributions, such as uniform, normal, and logistic.

> Lemma 1: (a) $\alpha_1 > \alpha_j$ for all j > 1, and $\alpha_1 > 0$. (b) Under the MHR condition, $\alpha_1 > \alpha_2 > \ldots > \alpha_n$.

(We defer proofs of all propositions to the Appendix and proofs of all lemmas to the Web Appendix [http://www.marketingpower.com/jmjuly09].)

Lemma 1a shows that the first share is superior to any other share in terms of return factors, regardless of the number of advertisers or the type distribution. The intuition for this result is as follows: The marginal revenue of the high types (close to $\bar{v}$) is the highest, regardless of the type distribution. Meanwhile, advertisers with the highest types are more likely to win the first share. Therefore, the first share has the advantage of securing the advertisers with the highest marginal revenue, thus generating the highest return. Recall that the return factor of the jth share is the expected marginal revenue of the winner of the jth share. This implies that the return factor of the first share is the highest.

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[5] Both Bulow and Roberts (1989) and Klemperer (1999) use the term "marginal revenue" under a single-object auction setting. Marginal revenue generated by an advertiser is different from the actual revenue generated by the same advertiser because marginal revenue also accounts for the impact of this advertiser's participation on other advertisers.

The intuition for Lemma 1b is as follows: In general, a high-type advertiser is more likely to win a high-ranked share than a low-ranked share, and the reverse is true for a low-type advertiser. The MHR condition, which implies that a high-type advertiser has higher marginal revenue than a low-type advertiser, reinforces the advantage of offering a high-ranked share (in terms of the revenue generated), thus ensuring a decreasing order among return factors.

Lemma 1 has immediate implications for the linear valuation case. With linear valuation $Q(s) = s$, an advertiser's valuation of a share becomes $u(v, s) = vs$. Thus, v can be interpreted as advertisers' marginal valuation. The problem with choosing an optimal share structure (Equation 9) becomes the following constrained linear program:

$$(10) \qquad \max_{s_1, s_2, \ldots, s_n} \sum_{j=1}^{n} \alpha_j s_j, \text{ subject to Equation 1.}$$

Because α_1 is the largest among all the return factors by Lemma 1, the advertising provider should allocate all the resources to the first share, leading to a winner-take-all share structure. Under the MHR condition, return factors decrease. The winner-take-all result can be strengthened to a greedy allocation—that is, to fill up the jth share before the (j + 1)th share. The strengthened result is useful when, for example, the first share must be less than 1. The following proposition summarizes this intuition:

P_1: If advertisers' valuation is linear in share size, (a) it is optimal to provide one grand share of size 1 (whenever possible), and (b) when the MHR condition holds, the advertising provider should allocate the resources in a greedy way—that is, to fill up the jth share before moving on to the (j + 1)th share.

Recall that linear valuation corresponds to the setting in which advertisers' demand is perfectly elastic. This setting may hold approximately when the supply of advertising resources is small compared with the demand, given that advertisers' marginal valuation declines beyond a certain point. P_1 suggests that when advertisers' valuation is perfectly elastic, it is optimal to use a winner-take-all share structure.

Our analysis shows that a high-ranked share promotes higher bids from high-type advertisers than a low-ranked share, provided that the two shares have the same size. The opposite is true for low-type advertisers. Thus, in general, the optimal choice of share structure involves trading off between best motivating the high-type advertisers and best motivating the low-type ones. This might depend on how advertisers' types are distributed. Surprisingly, P_1 shows that it is always optimal to best motivate the high-type ones, regardless of the distribution of advertiser types or the number of advertisers.

It is also worth noting that when the MHR condition is violated, return factors may not follow a descending order; therefore, the greedy allocation that P_{1b} specifies may not be optimal, as the following example proves:

Example 1: Let $F(v) = (v - 1)^{1/4}$, $v \in [1, 2]$, and $n = 3$. Assume that share sizes cannot exceed .5. Calculation shows that the return factors are 1.14, .91, and .94, respectively. A greedy allocation, (.5, .5, 0), generates an expected revenue of 1.029, whereas the optimal share structure, (.5, .25, .25), generates an expected revenue of 1.036.

Concave Valuation

P_1 suggests that the advertising provider should allocate all the resources to the first share in the case of linear valuation. This would require the top bidder to appear in all available advertising slots for a particular keyword. However, this is seldom the case. One explanation could be that advertisers' valuation is nonlinear in share sizes. We address the nonlinear valuation case in this section.

When $Q(\cdot)$ is convex, advertisers' marginal valuation, $vQ'(s)$, increases with the share size. Thus, the advertising provider has a stronger incentive to create a larger share than in the linear valuation case. Consequently, the results in P_1 continue to hold. Thus, we focus on the case of concave $Q(\cdot)$.

In keyword advertising, $Q(\cdot)$ might be concave for at lease two reasons. First, consumers' attention devoted to an advertisement may be less than twice as much if we double the amount of time it is shown (Lilien, Kotler, and Moorthy 1992, p. 267). Second, the unit cost to fulfill consumers' requests may rise because of limited production/service capacity. Thus, advertisers' marginal valuation for exposure may decrease as the total exposures increase. For example, smaller e-commerce Web sites begin to lose some customers because of congestion problems as the traffic to the sites becomes very high.

In the case of concave valuation, advertisers' unit valuation decreases with share size and so does the unit price they are willing to pay. As a result, the advertising provider has additional incentive to offer advertising resources in smaller shares. The following example illustrates an optimal share structure with multiple shares. The optimal share structure consists of several groups of same-sized shares. We call each group a plateau. A plateau is nontrivial if it consists of more than one share.

Example 2: Let $F(v) = (v - 1)^{1/4}$, $v \in [1, 2]$, $n = 3$, and $Q(s) = \sqrt{s}$. Under this specification, the optimal share structure is (.4310, .2845, .2845). Thus, the first plateau consists of the first share, and the second plateau consists of the second and third shares.

When do nontrivial plateaus occur in optimal share structures? What determines the boundaries of plateaus (i.e., the first and the last shares of the plateaus)? Lemma 2 shows that plateau boundaries are intimately related to return factors. We denote the rank of the last share of the kth plateau as j_k:

Lemma 2: Under an arbitrary concave function Q(·), the rank of the last share of the kth plateau in the optimal share structure is recursively defined by (let $j_0 = 0$)[6]

$$(11)\qquad j_k = \underset{j \in \{j_{k-1}+1, \ldots, n\}}{\arg\max} \left\{\frac{1}{j - j_{k-1}} \sum_{l = j_{k-1}+1}^{j} \alpha_l\right\},\quad k = 1, 2, \ldots$$

In other words, the advertising provider must assign equal resources to $(j_k + 1)$th through (j_{k+1})th shares (defined in Equation 11) in the optimal share structure.

Equation 11 states that the last share of the kth plateau is chosen to maximize the average return factor of shares within that plateau. If the return factor of the first share of a plateau is higher than that of any lower-ranked share, the plateau should consist of only that share. Thus, if return factors of shares are strictly decreasing, as in the case of a MHR type distribution (see Lemma 1b), each plateau should consist of exactly one share. In other words, a low-ranked share should be assigned strictly fewer resources than a high-ranked share. Conversely, when return factors do not decrease in share ranks, which is likely to happen when the type distribution is not single peaked, plateaus may arise in the optimal share structure. In other words, the advertising provider may find it optimal to assign equal resources to multiple shares of different ranks.

We denote the average return factor of the kth plateau as follows:

$$(12)\qquad \bar{\alpha}_k \equiv \frac{1}{j_k - j_{k-1}} \sum_{j = j_{k-1}+1}^{j_k} \alpha_j.$$

Because the last share of a plateau is chosen to maximize the average return factor of that plateau, the average return factors ($\bar{\alpha}_k$'s) must strictly decrease, and the average return factor of the first l shares within a plateau is no greater than that of the remaining shares in that plateau.

The rationale for Lemma 2 is as follows: Suppose that instead of assigning equal resources to all shares within a plateau, the advertising provider assigns more resources to the lth share than to the $(l + 1)$th share in the plateau. The advertising provider can always shift a small amount of resources from each of the first l shares and spread them equally to the remaining shares in the plateau. This operation is profitable because our definition of j_k's guarantees that the average return factor of the first l shares in a plateau will be lower than that of the remaining ones in the same plateau. This process can continue until all shares within the plateau have equal sizes.

Lemma 2 also implies that the first plateau always consists of only the first share. This is because the return factor of the first share is higher than that of any other share (Lemma 1a).

Example 3: Continue with Example 2. Calculation shows that $\alpha_1 = 1.14$, $\alpha_2 = .91$, and $\alpha_3 = .94$. By definition of j_k's (Equation 11), $j_1 = 1$, and $j_2 = 3$ (because $\alpha_2 < (\alpha_2 + \alpha_3)/2$). Thus, the first plateau consists of the first share, and the second plateau consists of the second and third shares, confirming Example 2.

On the basis of the result in Lemma 2, we characterize the optimal share structure in the following proposition:

P_2: Given an arbitrary concave function Q(·), the optimal share structure is given by

$$(13)\qquad s^* = (z_1, \underbrace{z_2, \ldots, z_2}_{j_2 - j_1}, \underbrace{z_3, \ldots, z_3}_{j_3 - j_2}, \ldots, \underbrace{z_{k^*}, \ldots, z_{k^*}}_{j_{k^*} - j_{k^*-1}}, \underbrace{0, \ldots, 0}_{n - j_{k^*}}),$$

where $z_1 > z_2 > \ldots > z_{k^*} > 0$, and the number of positive plateaus (k^*) and their sizes $(z_1, \ldots, z_{k^*})$ are determined by

$$(14)\qquad \bar{\alpha}_1 Q'(z_1) = \bar{\alpha}_2 Q'(z_2) = \ldots = \bar{\alpha}_{k^*} Q'(z_{k^*}) \geq \bar{\alpha}_{k^*+1} Q'(0)$$

and $\Sigma_{k=1}^{k^*}(j_k - j_{k-1})z_k = 1$. The j_k's and $\bar{\alpha}_k$'s in Equations 13 and 14 are defined in Equations 11 and 12, respectively.

P_2 builds on Lemma 2 and illustrates how many resources should be assigned to each plateau. Equation 14 shows that the return of marginal resources at each plateau ($\bar{\alpha}_k Q'(z_k)$) must be equal. This is because, otherwise, the advertising provider can profitably shift the resources from a plateau with a low marginal return to ones with high marginal returns.

As Lemma 2 shows, the boundaries of plateaus are determined only by the return factors (and, thus, by the type distribution and the number of advertisers). In contrast, the number of positive plateaus and the share sizes for plateaus are jointly determined by the return factors and the shape of the valuation function (P_2). The characterization of the optimal share structure in P_2 holds for general concave valuations and type distributions.

Under the MHR condition, the return factors monotonically decrease, and therefore each plateau consists of a single share (Lemma 2). Thus, we have the following corollary:

Corollary 1: If the MHR condition holds, the optimal share structure s^*, together with the optimal number of positive shares, k^*, is determined by

$$(15)\qquad \alpha_1 Q'(s_1) = \alpha_2 Q'(s_2) = \ldots = \alpha_{k^*} Q'(s_{k^*}) \geq \alpha_{k^*+1} Q'(0)$$

and $\Sigma_{k=1}^{k^*} s_k = 1$. Furthermore, $s_1 > s_2 > \ldots > s_{k^*} > 0$.

These results suggest the following general procedure for determining the optimal allocation of advertising resources for winners of different ranks: First, the advertising provider should organize adjacent shares into groups, beginning with the first share, according to the principle of maximizing the average return factor within the group (Lemma 2). This process may result in several groups of shares, or plateaus, with strictly decreasing average return factors. Second, the advertising provider allocates each marginal resource to the plateau that yields the highest marginal return at the moment, until all advertising resources are allocated. This may result in total resources being spread across multiple plateaus because when advertisers' marginal valuation for resources decreases, a plateau with a higher average return factor but more resources can generate lower marginal returns than a plateau with a lower return factor but fewer resources. Finally, the advertising resources allocated to each plateau are split equally among shares in that plateau. If the distribution of advertisers' valuation is regular (i.e., type distribution satisfies the MHR condition), each plateau consists of exactly one share (Corollary 1). So the advertising provider can skip Step 1 and begin at Step 2.

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[6] If there are multiple maximums, we define j_k as the largest one.

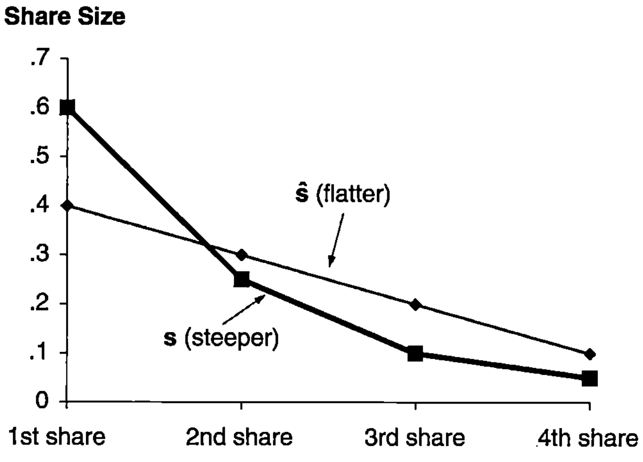
Optimal Share Structures and Underlying Supply and Demand Factors

In this section, we carry out a series of comparative-static analyses on the optimal share structure. These analyses serve two purposes. First, we generate more managerial guidelines for advertising networks and publishers to choose different share structures for different market settings. Second, by isolating the effects of underlying factors, we can gain more insights into the connection between the optimal share structure and the various underlying supply and demand factors. We examine several factors, including the shape of the advertisers' valuation function $Q(\cdot)$ the distribution of type v, and the total resources available. To measure the changes in share structures, we propose ordering share structures by their "steepness," which we define as follows:

> Definition 1 (steepness order): Let $s = (s_1, \ldots, s_n)$ and $\hat{s} = (\hat{s}_1, \ldots, \hat{s}_n)$ be two feasible share structures with $\Sigma_{j=1}^{n} s_j = \Sigma_{j=1}^{n} \hat{s}_j$. We define $\hat{s}$ as less steep (or flatter) than s if there is c, $c \in \{1, 2, \ldots, n\}$, such that
>
> (16) $\hat{s}_j < s_j, \forall j < c$ and $\hat{s}_j \geq s_j, \forall j \geq c$.
>
> We define $\hat{s}$ as strictly less steep (or strictly flatter) than s if $c > 1$ (if $c = 1$, $\hat{s}_j \geq s_j$ for any j, and two share structures must be identical because the total allocated resources are the same).

Graphically, Equation 16 dictates that the line connecting the less steep share structure ($\hat{s}$) crosses the line connecting the steeper share structure (s) at most once from below (for an example, see Figure 2). The less steep share structure, which has smaller high-ranked shares and larger low-ranked shares, is represented by a less steep line (this is why we call our measure a "steepness order"). A strict steepness order has the following properties: First, the number of (positive) shares in a flatter share structure is no less than the number of (positive) shares in a steeper one. Otherwise, some (zero-sized) low-ranked shares in the flatter share structure will be smaller than corresponding ones in the steeper share structure, contradicting our definition of being less steep. Second, a flatter share structure always has a smaller first share. Otherwise, the steepness order implies that the remaining shares in the flatter share structure would be at least as large as those in a steeper one, and therefore total resources in the flatter share structure are more than in the steeper one (unless they are identical), which is unlikely because of the total resource constraint. Third, the steepest share structure consists of one grand share (the winner-take-all), and the least steep one consists of n equal shares.

FIGURE 2
Steepness Order of Share Structures



In practice, the steepness order can be measured by the widely used Herfindahl index, which is defined as the sum of squares of shares. We can verify that the steeper the share structure, the higher is the Herfindahl index, but the converse is not necessarily true. For example, (.6, .2, .2) has a higher Herfindahl index than (.5, .35, .15), but the former is neither steeper nor flatter.

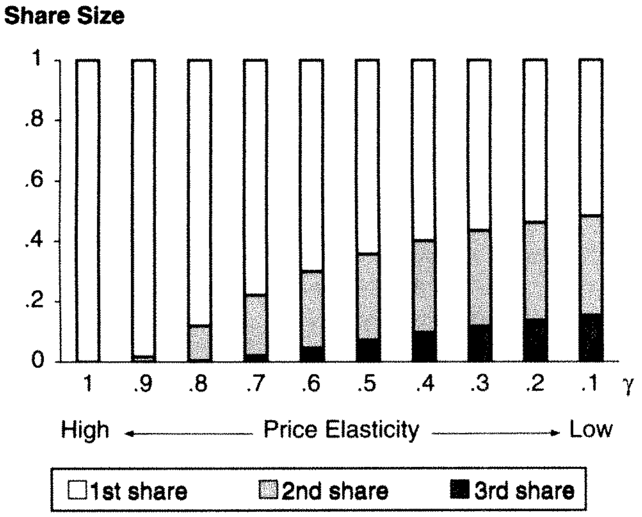
Concavity of the Valuation Function

We now consider the impact of the concavity of the valuation function on the optimal share structure. As we pointed out, the concavity of the valuation function can also be interpreted as the price elasticity of advertisers' demand. The literature on capacity-constrained services has shown that consumers' price elasticity plays an important role in the firm's optimal pricing policy (Desiraju and Shugan 1999). Here, we show that price elasticity also plays an important role in determining the optimal share structure. We begin with an example:

> Example 4: Let v be uniformly distributed on [1, 2], $n = 3$, and $Q(s_j) = s_j^{\gamma}$. Figure 3 shows the optimal sizes of the first, the second, and the third shares as functions of γ. Note that the smaller the γ, the more concave is the valuation function $Q(\cdot)$, and the less elastic is the advertisers' demand.

Example 4 shows that as advertisers' price elasticity decreases, the optimal share structure moves away from winner-take-all toward a more egalitarian share structure. Specifically, this example shows a gradual shift of resources away from the first share toward the second and third shares. Subsequently, we generalize this example to a broader setting.

FIGURE 3
Optimal Share Structure as a Function of γ, $Q(s) = s^{\gamma}$



We measure concavity by the commonly used concave transformation approach (Mas-Colell, Whinston, and Green 1995). Formally, let $Q(\cdot)$ and $\hat{Q}(\cdot)$ be strictly increasing and concave functions. We say that $\hat{Q}(\cdot)$ is more concave than $Q(\cdot)$ if there is an increasing concave function $\psi(\cdot)$ such that $\hat{Q}(x) = \psi(Q(x))$ for every $x > 0$.

> P_3: The optimal share structure becomes less steep as the concavity of $Q(\cdot)$ increases. Furthermore, if the optimal share structure under $Q(\cdot)$ is not winner-take-all, it becomes strictly less steep as the concavity of $Q(\cdot)$ increases.

According to P_3, as the valuation function becomes more concave, the optimal share structure moves away from winner-take-all toward n equal shares. Intuitively, as the valuation function becomes more concave, the advertising provider prefers many small shares to few large shares because advertisers value the former more. The strength of this proposition lies in the notion that the redistribution of resources occurs according to the steepness order rather than other ways. For example, if the current optimal share structure is (.5, .25, .25), we can rule out (.45, .35, .2) as a new optimal share structure if the valuation function becomes more concave. This proposition predicts that as the concavity increases, the number of shares weakly increases, the first share is usually smaller, and the low-ranked shares will not become smaller. Note that the result in P_3 holds regardless of the type distribution.

To our knowledge, this is the first study to establish the relationship between the concavity of advertisers' valuation (or the price elasticity of their demands) and the steepness of the optimal share structure. Moldovanu and Sela (2001) show that in an all-pay-auction model of contests, it may be optimal to award multiple prizes when contestants' disutility functions are convex. We establish a stronger bond between concavity of the valuation function and share structure for our setting; namely, not only can multiple shares become optimal under a concave valuation, but share structures can also become less steep as the valuation function becomes more concave.

The implication of P_3 is highly actionable. When advertisers' price elasticity is high or low, advertising providers can decide whether to provide steep share structures or flat ones. To achieve steep share structures, advertising providers can assign the top bidders to the best slots at all times and across all Web sites. They can also use premium displays to enhance the fraction of exposure allocated to those advertisers. To achieve flat share structures, advertising providers can randomize the allocation of advertising slots among winners of different ranks to ensure that they receive relatively equal shares of the total exposure.

Advertising providers can estimate the advertisers' price elasticity from their bidding history. They can also conduct experiments to observe how advertisers' willingness to pay changes with the expected volume they receive. An advantage of online advertising is that advertising providers can conduct such experiments at a relatively low cost because perturbations of their systems can be done electronically and take effect instantly.

Type Distribution

The distribution of types varies across different keywords. Some keywords are more expensive than others. For example, advertisers for "mortgage" sometimes bid as high as $40 per thousand impressions, whereas advertisers for "CD" usually bid less than $1 per thousand impressions. The distribution of willingness to pay per impression may also differ from one keyword to another. For example, keywords with broad appeal may attract advertisers from different industries with wildly different willingness to pay, whereas highly specific keywords may attract advertisers of a narrowly defined industry with relatively homogeneous willingness to pay. The question is how the advertising providers should tailor the share structure offerings for different type distributions.

The type distribution affects the optimal share structure through the return factors. To study the effect of the type distribution, we must first understand how the return factors affect steepness of the optimal share structure. Lemma 3 associates the steepness with return factors:

> Lemma 3: Let $Q(\cdot)$ be an arbitrary concave function and $\mathbf{s}$ and $\hat{\mathbf{s}}$ be the optimal share structures under return factor vectors $\boldsymbol{\alpha} = (\alpha_1, \ldots, \alpha_n)$ and $\hat{\boldsymbol{\alpha}} = (\hat{\alpha}_1, \ldots, \hat{\alpha}_n)$, respectively. If we assume that the plateau boundaries under $\boldsymbol{\alpha}$ and $\hat{\boldsymbol{\alpha}}$ are the same,[7] $\hat{\mathbf{s}}$ is less steep than $\mathbf{s}$ if

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[7] This result can be extended to share structures with different plateau boundaries. To do so, we can "iron out" the peaks in the return factors in each share structure by defining a normalized return factor vector $\boldsymbol{\beta} \equiv (\beta_1, \ldots, \beta_n)$ such that $\beta_{j_{k-1}+1} = \ldots = \beta_{j_k} = \bar{\alpha}_k$, for each k. The normalized return factor vector retains the original plateau boundaries and average return factors and is nonincreasing. The optimal share structure under the normalized return factor vector is the same as under the original one because, according to P_2, all that matters to the optimal share structure problem is the average return factors. We can then compare share structures based on normalized return factors using the following result: $\hat{\mathbf{s}}$ is less steep than $\mathbf{s}$ if $\hat{\beta}_{j+1}/\hat{\beta}_j \geq \beta_{j+1}/\beta_j$, for any j such that $s_{j+1} > 0$ (the proof is similar to the proof of Lemma 3).

$$(17)\ \frac{\hat{\bar{\alpha}}_{k+1}}{\hat{\bar{\alpha}}_k} \geq \frac{\bar{\alpha}_{k+1}}{\bar{\alpha}_k},\ \text{for any k such that } z_{k+1} > 0,$$

and $\hat{\mathbf{s}}$ is strictly less steep than **s** if at least one strict inequality holds in Equation 17.

Lemma 3 shows that if $\hat{\bar{\alpha}}_{k+1}/\hat{\bar{\alpha}}_k$ is closer to 1 (the average return factors of different plateaus are more equal), the optimal share structure will be flatter. Intuitively, the optimal condition requires equal marginal revenue across shares. When average return factors of different plateaus become more equal, less variation in resources allocated to shares across different plateaus is required to achieve equal marginal revenue. Thus, the optimal share structure will be flatter. Next, we examine how the type distribution affects ratios of return factors.

The type distribution is "scaled" if each advertiser's type parameter is multiplied by a common factor. Advertisers' type distribution is "shifted" to the right if each advertiser's type parameter increases by a common factor. The following proposition summarizes the impact of scaling, shifting, and a change in the underlying type distribution, termed "marginal-revenue-ratio compression":

P_4: We use α_j and $\hat{\alpha}_j$ to denote the return factors under type distributions F and $\hat{F}$, respectively.

(a) (Scaling) When $\hat{F}$ is F scaled by a factor w (w > 0), the return factors $\hat{\alpha}_j = w\alpha_j$, and the optimal share structure remains the same.

(b) (Shifting) When $\hat{F}$ is F shifted to the right by w (w > 0), the return factors $\hat{\alpha}_j = \alpha_j + w$, and the optimal share structure becomes less steep.

(c) (Marginal-revenue-ratio compression) We assume that both type distributions are MHR and have positive marginal revenues. When the ratio of marginal revenues at any two percentiles y and x (y > x) under $\hat{F}$ is smaller than that under F, $\hat{\mathbf{s}}$ is less steep than **s**.[8]

The intuition for P_{4a} is as follows: When all advertisers' valuation is scaled by factor w, their equilibrium bids are scaled by the same factor, but their probabilities of winning remain the same. As a result, all the return factors are scaled by the same factor. Because what matters to the optimal share structure are the relative sizes of return factors, the optimal share structure should remain the same.

P_{4b} suggests that shifting to the right causes a flatter optimal share structure. Again, shifting does not change advertisers' winning probabilities, but it does cause all advertisers to increase their bids. The increase in low-type advertisers' bids is more significant because their type v has increased by a larger proportion. In turn, this reduces the ratios between the return factors of high-ranked shares and those of low-ranked shares because the low-ranked shares are more likely to be assigned to low-type advertisers. As the return factors for low-ranked shares increase relative to those for high-ranked shares, the optimal share structure should be less steep (Lemma 3).

P_{4c} suggests that the optimal share structure should be less steep if marginal revenue ratios between any two percentiles are compressed. This result highlights that what matters is the ratios of marginal revenues at different percentiles rather than the absolute marginal revenues.

Returning to the questions we raised at the beginning of the section, we can now report that the optimal share structure for expensive keywords may or may not be steeper than that for less expensive ones. If the distribution of advertisers' valuation (corresponds approximately to the type distribution) for more expensive keywords is simply a rescaling of that for less expensive ones, advertising providers should apply the same share structure for these keywords. For example, if advertisers' valuation factor for an expensive keyword is uniformly distributed on [2, 4] and if their valuation factor for a less expensive one is uniformly distributed on [1, 2], advertising providers should use the same share structure for these two keywords. In contrast, if advertisers' valuation factor for the more expensive keyword is uniformly distributed on [4, 5], advertising providers should use a flatter share structure for the more expensive keywords. As P_{4c} suggests, if the marginal revenue contribution of advertisers at low percentiles closes in on that of advertisers at high percentiles, advertising providers should use a flatter share structure, and vice versa. In practice, advertising providers may learn advertisers' marginal revenues by observing the actual revenue generated per exposure.

Total Resources

So far, we have assumed that the total resource is fixed and normalized to 1. In this subsection, we allow the total resources to change and examine the impact on optimal share structures.

The total resources available to advertisers change with the number of searches conducted (in sponsored search) and the number of page views (in contextual advertising). The total resources may change over time for many reasons, including a change in the popularity of the Web sites, increased searches on particular keywords because of special events, and new additions to the advertising networks. For example, when Google signed a contract with AOL to serve online advertisements on AOL.com, Google's keyword advertising resources surged. How should advertising providers adjust their share structures according to the total resources available?

Our characterization of the optimal share structures in P_1 and P_2 still holds, except that total available resources are no longer 1. Moreover, when total resource is the only changing factor, the return factors are the same, and therefore the boundaries of plateaus should remain the same (Lemma 2). Therefore, we can concentrate on how the total resources are allocated among different plateaus. We observe the following trend in the absolute share sizes, the number of shares, and the relative share sizes in the optimal structure:

P_5: Under a concave $Q(\cdot)$, as the total resources increase, (a) the size of each positive share increases and the number of positive shares weakly increases, and (b) a high-ranked share increases by a smaller (bigger or the same) percentage than a low-ranked one, if advertisers' price elasticity decreases (increases or remains constant) in the amount of resources allocated to them.

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[8] For a formal representation of this condition, see the Appendix.

The intuition for P_{5a} is as follows: As the amount of total resources available increases, the marginal return of resources should decrease because of the concavity of the advertisers' valuation. Because the return factor of each share remains the same, the resource allocated to each share must increase. Otherwise, the marginal return from each share will be equal to or higher than previously, contradicting the argument that the marginal return of resources should decrease.

P_{5b} suggests that whether some shares increase more in proportion to others depends on how advertisers' price elasticity changes with the resources allocated to them. Intuitively, when advertisers have a decreasing price elasticity, their demand becomes less elastic as shares become larger. Thus, when the total resources increase, the advertising provider should increase high-ranked shares by a smaller percentage. Conversely, when advertisers have increasing (constant) price elasticity, the advertising provider should increase high-ranked shares by a larger (equal) percentage.[9]

To compare share structures with different amounts of total resources, we can calculate relative share sizes by dividing absolute share sizes by the total resources available. P_5 effectively posits that as the total resources increase, the optimal share structure with relative share sizes becomes flatter (becomes steeper or remains constant) if advertisers' price elasticity decreases (increases or remains constant) in the amount of resources allocated to them. Thus, P_5 reveals a connection between the steepness of optimal share structures with relative share sizes and how advertisers' price elasticity changes with resources allocated to them. Increasing the total resources does not change relative share sizes per se. Rather, it changes relative share sizes only when an increase in the total resources alters advertisers' price elasticity on the margin.

The Case with Minimum Bids

In this section, we extend our model to the case in which minimum bids are imposed. Online advertising providers often use minimum bids in their advertising auctions. For example, Google currently requires that advertisers bid at least $.25 per thousand impressions in its contextual advertising. Yahoo requires a minimum bid of $.10 for all keywords. Some researchers have studied the role of minimum bids in traditional online auction settings (Kamins, Dreze, and Folkes 2004; Suter and Hardesty 2005). This literature shows that minimum bids can increase sellers' earnings in online consumer-to-consumer auctions (Suter and Hardesty 2005). Here, we focus on how the introduction of minimum bids affects the optimal share structure.

Imposing a minimum bid prevents some low-type advertisers from participating in the auction because bidding higher than the minimum bid would result in negative payoffs for them. We assume that the effect of a minimum bid is such that any advertiser of a type higher than v_0 participates in the auctions and any advertiser of a type lower than v_0 does not. We call v_0 the marginal type.

Using a similar approach outlined in the Web Appendix (http://www.marketingpower.com/jmjuly09) for deriving expected revenue without minimum bids, we can derive the expected revenue under a given marginal type v_0 as follows:

$$\pi = n\sum_{j=1}^{n} Q(s_j)\int_{v_0}^{\bar{v}} P_j(v)J(v)f(v)dv. \tag{18}$$

We assume that the advertising provider chooses the optimal marginal type v_0^* to maximize the total expected revenue (for the derivation of v_0^*, see the proof of P_6), and v_0^* is invariant to the share structure.[10] We also assume that $v_0^* > \underline{v}$ avoids the trivial case.

We redefine the return factors as follows:

$$\alpha_j(v_0) \equiv n\int_{v_0}^{\bar{v}} P_j(v)J(v)f(v)dv. \tag{19}$$

Different from the no-minimum-bid case, the return factors are now functions of the marginal type. We show in the Web Appendix (in Lemma W1) that Lemma 1b carries over to this case; that is, under the MHR condition, the return factors of different shares decrease (see http://www.marketingpower.com/jmjuly09). This is because excluding low-type advertisers reinforces the advantages of high-ranked shares in generating returns. It follows that P_{1b} carries over as well; that is, when the MHR condition holds and the valuation is linear, the advertising provider should use a greedy allocation among shares.

Given any marginal type, the characterizations of optimal share structures in P_2 and Corollary 1 continue to hold. So do the comparative-static results on the concavity of valuation function (P_3) and on total resources (P_5). In addition, the results on scaling and shifting of type distribution in P_4 continue to hold as long as the marginal type is adjusted accordingly.

We now examine the impact of minimum bids on optimal share structures. Properly set minimum bids exclude low-type advertisers with negative marginal revenues and thus improve the return factors of all shares. However, the improvements may differ across shares. Therefore, the optimal share structure may change as a result of imposing minimum bids, as the following proposition suggests:

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[9] For example, assume that there are two advertisers, $\alpha_1 > \alpha_2 > 0$ and $\alpha_1 < 2\alpha_2$ (to rule out the winner-take-all case). We can easily verify that $Q(s) = \sqrt{s}$ and $Q(s) = \ln(s + 1)$ correspond to a constant-price-elasticity case and a decreasing-price-elasticity case, respectively. In the former case, the optimality condition (Equation 15) implies that $-\alpha_1/(2\sqrt{s_1^*}) = -\alpha_2/(2\sqrt{s_2^*})$. Thus, the relative size of the first share, $s_1^*/(s_1^* + s_2^*)$, is a constant $[= \alpha_1{}^2/(\alpha_1{}^2 + \alpha_2{}^2)]$. In the latter case, the optimality condition (Equation 15) implies that $(s_1^* + 1)/(s_2^* + 1) = \alpha_1/\alpha_2$. We can verify that the relative size of the first share, $s_1^*/(s_1^* + s_2^*)$, decreases as the total resources increase.

[10] Under reasonable conditions, v_0^* is unique and is invariant to the share structure. For example, under the MHR condition, the marginal revenue function J(v) crosses zero from below at most only once, and thus it is optimal to set the optimal marginal type to the crossing point or to $\underline{v}$, whichever is higher. Neither depends on the share structure. When the MHR condition is not satisfied, J(v) may cross zero multiple times, and the optimal marginal type is one of the crossing points. But in many cases, the optimal marginal type is the same crossing point for different share structures.

P_6: If the MHR condition holds, the optimal share structure under the optimal minimum bid is flatter than under no minimum bid.

Intuitively, minimum bids exclude low-type advertisers who have negative marginal revenues and thus increase the total expected revenue. If permitted in the auction, these advertisers would more likely win low-ranked shares than high-ranked ones. Therefore, excluding them results in relatively larger improvements on the marginal returns of low-ranked shares than on those of high-ranked ones. This implies that resources should be shifted toward low-ranked shares, and the optimal share structure should be flatter.

Conclusion

Auctions are crucial to the functioning of keyword advertising in which millions of different keywords are sold each day. It is imperative to study how to best auction keywords because keyword advertising also holds great promise for other advertising markets that hope to replicate its success. Existing research on keyword auctions has largely focused on the ranking of advertisers (e.g., Weber and Zheng 2007) and payment rules (e.g., Edelman, Ostrovsky, and Schwarz 2007), taking objects to be auctioned as given. Little research has been conducted on the "resource-package" issue that precedes auctions—that is, how to package and recombine different advertising resources for each keyword phrase before auctioning them to advertisers. We argue that the resource-packaging issue has increasing importance as more resources become available for auctioning. In this article, we take a first step to study a share structure problem—namely, of the total available resources, how large a share should be set aside for the highest bidder, for the second-highest bidder, and so on.

The share structure issue is important for advertising networks and publishers. As we show, the optimal share structures change with multiple underlying demand and supply factors. Advertising providers may find it necessary to actively adjust their share structures for several reasons. First, the supply of advertising resources fluctuates as publishers join and leave advertising networks and as publishers' draw of online users rises and falls. Second, the demand for advertising on each keyword phrase shifts constantly in response to changes in underlying market trends. The importance of the share structure issue will grow as the demand for and supply of keyword advertising grow stronger and become more dynamic.

We study the optimal share structure problem in a framework in which an advertising provider offers the total advertising resources in as many as n shares to n advertisers. The advertising provider allocates all shares simultaneously using a unit price auction. Advertisers' valuation for a share is affected both by their private valuation factor (or their "type") and by the size of the share. Our model allows advertisers' valuation factor to follow a general distribution and advertisers' valuation to depend on the size of the share by a general increasing function. Using this framework, we characterize the optimal share structures and investigate how they change with several underlying factors. Although we examine this issue from the advertising providers' revenue-maximization perspective, we believe that the share structure issue also has important implications for advertisers and the overall efficiency of the keyword advertising market.

Although we use keyword auctions as our study setting, our findings may have implications for other areas. This is because keyword-auction-like mechanisms may be used for other divisible goods with capacity constraints, such as network bandwidth, grid-computing power, television broadcasting rights, and digital billboard advertising. For example, Google filed a proposal on May 21, 2007, with the Federal Communications Commission calling on using keyword-auction-like mechanisms to allocate radio spectrum to increase market efficiency.

Implications for Managers

Our characterization of the optimal share structure and of the impact of the underlying demand and supply factors generates several insights for advertising providers. First, emerging from our analysis is a key determinant of optimal share structures: advertisers' price elasticity. We define advertisers' price elasticity as the percentage change in advertisers' demand for exposure resulting from a 1% change in the price per unit of exposure. When the price elasticity of advertisers' demand for exposure is high, advertising providers should use a steep share structure. In other words, advertising providers should allocate most of their resources to the top bidders. When the price elasticity is low, advertising providers should use a relatively flat share structure. This means that they should spread the total advertising resources relatively evenly among advertisers of different ranks. Advertising providers can estimate advertisers' price elasticities by examining the accumulated data on advertisers' willingness to pay and their purchase volumes or by conducting market research with a sample of advertisers.

Second, another important determinant is the return factors of different shares. Return factors reflect the difference in return for the same amount of resources allocated to different shares. When the return factor of a high-ranked share is strictly higher than that of a lower-ranked share, which holds true under uniform, normal, or exponential distributions, the optimal share structure should strictly decrease; that is, a higher-ranked share should be strictly greater than a lower-ranked share. Otherwise, the optimal share structures may have plateaus; that is, advertising providers may allocate equal amounts for two or more shares. Whether return factors decrease in shares is determined mainly by the distribution of advertisers' valuation.

Because the distribution of valuation determines return factors, changes in the underlying valuation distribution may lead to different optimal share structures. The rule of thumb is that the ratio of return factors rather than absolute values determines the optimal share structure. For example, when the valuation distribution is scaled by a common factor, all return factors are also scaled by the same factor, and the optimal share structure remains the same. When the valuation distribution shifts (to the right) by a common factor, return factors for low-ranked shares increase by a higher percentage than those for high-ranked shares, and the optimal share structure should be flatter. Therefore, it is not the absolute difference in advertisers' valuation for keywords but rather the relative difference that affects the optimal share structures. Advertising providers can estimate return factors for different ranks by conducting controlled experiments.

Third, advertising providers should react to changes in total advertising resources according to advertisers' price elasticity. Specifically, advertising providers should allocate proportionally fewer resources to high-ranked shares when advertisers' price elasticity decreases with the total exposure they receive, and advertising providers should allocate proportionally more to high-ranked shares when advertisers' price elasticity increases. Whether advertisers have increasing (constant or decreasing) price elasticity may depend on whether their underlying businesses have an economy of scale (constant return or diseconomy of scale). For example, businesses that do not scale well because of their capacity constraints (i.e., suffer a diseconomy of scale) tend to display decreasing price elasticity.

Finally, advertising providers should coordinate between the minimum bids and the optimal share structures. In general, advertising providers should use flatter share structures when they use minimum bids. If advertising providers decide to raise minimum bids, in general they should offer flatter structures at the same time.

Implications for Further Research

This research highlights the issue of optimal share structure as an important strategic dimension in keyword auctions. Our research serves as a starting point for marketers to understand novel keyword auctions. Further research is needed in several directions. First, it would be worthwhile to test our theoretical predictions empirically on the optimal share structures for different settings. One way to test our results directly would be to conduct laboratory or field experiments. Another way would be to estimate the underlying supply and demand factors of existing keyword auctions and use estimated parameters to project the gain in auction revenues if optimal share structures were used.

Second, the problem of how resources should be packaged for auctioning should be examined in broader and more complex settings. As a first study of share structures, we have kept our research model simple, focusing on factors that are most relevant to the share structure problem. For example, we assumed that advertisers' valuation for exposures can be captured by a single valuation factor. Thus, in our model, advertisers are "vertically" differentiated. Cases may also exist in which advertisers are "horizontally differentiated" (i.e., some advertisers may prefer one resource, while others prefer another). It would be worthwhile to examine how advertising providers should package their resources in such a horizontally differentiated setting.

Finally, why the current keyword auction format has become the mechanism of choice is also a question for further research. In traditional divisible goods auctions, such as for electricity, pollution permits, and treasury notes (Wang and Zender 2002; Wilson 1979), auctioneers ask each buyer to report both a price and a desired share size (quantity). Auctioneers subsequently solve the market-clearance problem by using buyers' price/share quotes, whereas in keyword auctions, auctioneers "prepackage" resources into shares, and advertisers simply bid on prices only. Several reasons may be in favor of such a simple mechanism. Keeping the auction mechanism easy to understand and easy to participate in is essential to facilitate participation of tens of thousands of advertisers, many of which are small advertisers on the "long tail" and may otherwise be excluded from online advertising. Reaching the long tail of the advertising market is a key advantage of online advertising providers. Moreover, winner determination in share auctions is straightforward, making it suitable for real-time environments. However, it remains interesting to compare the current auction format with potential alternatives, such as the conventional discriminatory-price and uniform-price auctions used for treasury bonds (Wang and Zender 2002; Wilson 1979).

Appendix: Proof of Propositions

Proof of P_1 (Omitted)

Proof of P_2

Suppose that we have m plateaus. In accordance with Lemma 2, shares are equal in size within a plateau. We denote $n_k \equiv j_k - j_{k-1}$ as the number of shares in plateau k and z_k as the size of a share in that plateau. Recall that $\overline{\alpha}_k$ decreases in k. Without loss of generality, we assume that there are $k_0 \in \{1, 2, \ldots, m\}$, such that $\overline{\alpha}_{k_0} > 0 \geq \overline{\alpha}_{k_0+1}$. It is never optimal to allocate resources to plateaus with nonpositive average return factors. Therefore, $z_{k_0+1} = \ldots = z_m = 0$ in the optimal share structure. Then, the optimal share structure problem is as follows:

$$\text{(A1)}\quad \max_{\{z_1, \ldots, z_{k_0}\}} \sum_{k=1}^{k_0} n_k \overline{\alpha}_k Q(z_k), \text{ subject to } z_1 \geq \ldots \geq z_{k_0} \geq 0 \text{ and}$$

$$\sum_{k=1}^{k_0} n_k z_k \leq 1.$$

The Lagrangian function for Equation A1 is as follows (note that $z_{k_0+1} = 0$):

$$\text{(A2)}\quad L(s, \mu, \lambda) = \sum_{k=1}^{k_0} n_k \overline{\alpha}_k Q(z_k) + \mu\left(1 - \sum_{k=1}^{k_0} n_k z_k\right)$$

$$+ \sum_{k=1}^{k_0} \lambda_k (z_k - z_{k+1}),$$

where μ and λ_k are Lagrange multipliers. Thus, the Kuhn–Tucker conditions are as follows (define $\lambda_0 \equiv 0$):

$$\text{(A3)}\quad n_k \overline{\alpha}_k Q'(z_k) - n_k \mu + \lambda_k - \lambda_{k-1} = 0, \text{ for } k = 1, 2, \ldots, k_0.$$

If $\lambda_1 = \ldots = \lambda_{k_0} = 0$, in accordance with Equation A3, we immediately have the following: $\overline{\alpha}_1 Q'(z_1) = \ldots = \overline{\alpha}_{k_0} Q'(z_{k_0}) \geq \overline{\alpha}_{k_0+1} Q'(0)$. Otherwise, there must be k (k <

k_0), such that $\lambda_0 = \ldots = \lambda_k = 0$ and $\lambda_{k+1} > 0$. From Equation A3,

$$\text{(A4)}\quad \bar{\alpha}_{k+1}Q'(z_{k+1}) - \mu + \frac{\lambda_{k+1} - \lambda_k}{n_{k+1}} = \bar{\alpha}_{k+2}Q'(z_{k+2})$$

$$-\mu + \frac{\lambda_{k+2} - \lambda_{k+1}}{n_{k+2}}.$$

Note that $\bar{\alpha}_{k+1} > \bar{\alpha}_{k+2} > 0$ and $z_{k+1} = z_{k+2}$ (because $\lambda_{k+1} > 0$). Equation A4 requires that $\lambda_{k+2} > \lambda_{k+1} > 0$. Using the similar logic repeatedly, we can get $\lambda_{k_0} > \ldots > \lambda_{k+2} > \lambda_{k+1} > 0$, which implies that $z_{k_0+1} = z_{k_0} = \ldots = z_{k+1} = 0$ (because $z_{k_0+1} = 0$). Substituting the λ sequence into Equation A3, we get the following:

$$\text{(A5)}\quad \bar{\alpha}_1 Q'(z_1) = \bar{\alpha}_2 Q'(z_2) = \ldots = \bar{\alpha}_k Q'(z_k) \geq \bar{\alpha}_{k+1} Q'(0),$$

which implies that $z_1 > z_2 > \ldots > z_k$ (because $\bar{\alpha}_k$ decreases and $Q(\cdot)$ is concave).

In addition, we have $\mu > 0$ from Equation A3 when k = 1, which implies that $\Sigma_{k=1}^{k_0} n_k z_k = 1$; that is, all the resources are offered in the optimal share structure.

Proof of P_3

We assume that $\hat{Q}(\cdot)$ is more concave than $Q(\cdot)$; that is, there is a concave function $\psi(\cdot)$ such that $\hat{Q}(\cdot) = \psi(Q(\cdot))$. Note that

$$\frac{\hat{Q}'(x)}{Q'(x)} = \psi'(Q(x)),$$

which decreases in x. Therefore, for any x_1 and x_2 ($x_1 < x_2$),

$$\text{(A6)}\quad \frac{\hat{Q}'(x_1)}{\hat{Q}'(x_2)} > \frac{Q'(x_1)}{Q'(x_2)}.$$

We denote **s** and $\hat{\mathbf{s}}$ as the optimal share structures under $Q(\cdot)$ and $\hat{Q}(\cdot)$, respectively. To show that $\hat{\mathbf{s}}$ is less steep than **s**, it is sufficient to show the following:

$$\text{(A7)}\quad \hat{s}_j \geq s_j \Rightarrow \hat{s}_{j+1} \geq s_{j+1},\ \forall j.$$

Note that **s** and $\hat{\mathbf{s}}$ have identical plateau boundaries by Lemma 2. If j and j + 1 are located in the same plateau, $s_j = s_{j+1}$ and $\hat{s}_j = \hat{s}_{j+1}$, and then $\hat{s}_{j+1} \geq s_{j+1}$ holds trivially. Otherwise, we assume that j and j + 1 are located in plateau k and k + 1, respectively. We focus on the nontrivial case $s_{j+1} > 0$. In accordance with P_2, we have $\bar{\alpha}_k \hat{Q}'(\hat{s}_j) \geq \bar{\alpha}_{k+1}\hat{Q}'(\hat{s}_{j+1})$ and $\bar{\alpha}_k Q'(s_j) = \bar{\alpha}_{k+1}Q'(s_{j+1})$. Thus:

$$\text{(A8)}\quad \frac{\hat{Q}'(\hat{s}_{j+1})}{\hat{Q}'(\hat{s}_j)} \leq \frac{Q'(s_{j+1})}{Q'(s_j)}.$$

Combining Equation A8 with $[\hat{Q}'(\hat{s}_{j+1})/\hat{Q}'(s_j)] \leq [\hat{Q}'(\hat{s}_{j+1})/\hat{Q}'(\hat{s}_j)]$ (because of the concavity of $\hat{Q}(\cdot)$) and $[Q'(s_{j+1})/Q'(s_j)] < [\hat{Q}'(s_{j+1})/\hat{Q}'(s_j)]$ (because of Equation A6), we have

$$\frac{\hat{Q}'(\hat{s}_{j+1})}{\hat{Q}'(s_j)} < \frac{\hat{Q}'(s_{j+1})}{\hat{Q}'(s_j)},$$

which implies that $\hat{s}_{j+1} > s_{j+1}$.

We now show that $\hat{s}_1 < s_1$, if $s_2 > 0$. If $\hat{s}_1 \geq s_1$, we know from the preceding proof that $\hat{s}_2 > s_2$ (note that s_1 and s_2 are not in the same plateau by P_2) and $\hat{s}_j \geq s_j$ for j > 2, which contradicts that $\Sigma_{j=1}^{n} s_j = \Sigma_{j=1}^{n} \hat{s}_j$.

Proof of P_4

P_{4a}. We denote $\hat{F}(wv)$ as the distribution function after scaling. Clearly, $\hat{F}(wv) = F(v)$, and thus $\hat{P}_j(wv) = P_j(v)$. It is easy to verify that $\hat{f}(wv) = f(v)/w$ and $\hat{J}(wv) = wJ(v)$. In light of these relationships, we have the following:

$$\hat{\alpha}_j = n\int_{w\underline{v}}^{w\bar{v}} \hat{P}_j(x)\hat{J}(x)\hat{f}(x)dx = n\int_{w\underline{v}}^{w\bar{v}} P_j\left(\frac{x}{w}\right)J\left(\frac{x}{w}\right)f\left(\frac{x}{w}\right)dx$$

$$= wn\int_{\underline{v}}^{\bar{v}} P_j(v)J(v)f(v)dv = w\alpha_j,$$

where the third step is due to integration by substitution.

Given $\hat{\alpha}_j = w\alpha_j$, the j_k sequence remains the same as before by definition, suggesting that the boundaries of the plateaus will be the same. In addition, the optimal solution to Equation 14 is invariant to a scaling of $\hat{\alpha}_j$'s, suggesting that the optimal share size for each plateau is also the same.

P_{4b}. We denote $\hat{F}(v + w)$ as the distribution function after shifting. Clearly, $\hat{F}(v + w) = F(v)$, and thus $\hat{P}_j(v + w) = P_j(v)$. It is easy to verify that $\hat{f}(v + w) = f(v)$ and $\hat{J}(v + w) = J(v) + w$. In light of these relationships, we have the following:

$$\text{(A9)}\quad \hat{\alpha}_j = n\int_{\underline{v}+w}^{\bar{v}+w} \hat{P}_j(x)\hat{J}(x)\hat{f}(x)dx$$

$$= n\int_{\underline{v}+w}^{\bar{v}+w} P_j(x-w)\big[J(x-w)+w\big]f(x-w)dx$$

$$= wn\int_{\underline{v}}^{\bar{v}} P_j(v)f(v)dv + n\int_{\underline{v}}^{\bar{v}} P_j(v)J(v)f(v)dv = w + \alpha_j,$$

where the third step is due to integration by substitution and the last step is because

$$\text{(A10)}\quad \int_{\underline{v}}^{\bar{v}} P_j(v)f(v)dv = \binom{n-1}{n-j}\int_{\underline{v}}^{\bar{v}} F(v)^{n-j}\big[1-F(v)\big]^{j-1}dF(v)$$

$$= \binom{n-1}{n-j}\int_0^1 x^{n-j}(1-x)^{j-1}dx$$

$$= \binom{n-1}{n-j}\binom{n-1}{n-j}^{-1}\frac{1}{n} = \frac{1}{n}.$$

Given $\hat{\alpha}_j = w + \alpha_j$, the j_k sequence remains the same as before by definition, suggesting that the boundaries of the plateaus will be the same. However, the ratio of average return factors decreases because when w > 0,

$$\frac{\bar{\alpha}_{k+1}}{\bar{\alpha}_k} < \frac{\bar{\alpha}_{k+1} + w}{\bar{\alpha}_k + w}.$$

Therefore, the optimal share structure becomes less steep (Lemma 3).

P_{4c}. We denote $\vartheta(x) \equiv J(F^{-1}(x))$ as the marginal revenue contribution of an advertiser whose type is at the x per-

centile of the population. We can formally represent the condition in this result as follows:

$$\text{(A11)}\qquad \frac{\hat{\vartheta}(y)}{\hat{\vartheta}(x)} \le \frac{\vartheta(y)}{\vartheta(x)}, \text{ for any } 0 \le x < y \le 1.$$

Under the MHR condition, $\overline{\alpha}_j$ sequence coincides with α_j sequence. So, in accordance with Lemma 3, a sufficient condition for $\hat{s}$ to be less steep than s is as follows:

$$\text{(A12)}\qquad \frac{\hat{\alpha}_{j+1}}{\hat{\alpha}_j} \ge \frac{\alpha_{j+1}}{\alpha_j}, \text{ whenever } s_{j+1} > 0.$$

We denote $P_j^n(x) \equiv \binom{n-1}{n-j} x^{n-j}(1-x)^{j-1}$. We can then write the following:

$$\alpha_j = n\int_{\underline{v}}^{\overline{v}} P_j^n(F(v))J(v)f(v)dv = n\int_0^1 P_j^n(x)\vartheta(x)dx.$$

Noting that $\hat{\alpha}_{j+1} > 0$ and $\alpha_{j+1} > 0$ (from $\hat{\vartheta}(x) > 0$ and $\vartheta(x) > 0$), we can rewrite Equation A12 as follows:

$$\int_0^1 P_{j+1}^n(x)\vartheta(x)dx \int_0^1 P_j^n(x)\hat{\vartheta}(x)dx$$
$$\le \int_0^1 P_j^n(x)\vartheta(x)dx \int_0^1 P_{j+1}^n(x)\hat{\vartheta}(x)dx.$$

In line with the work of Athey (2002), this equation holds if the following two conditions are satisfied:

$$\text{(A13)}\qquad P_{j+1}^n(x)\vartheta(x) \times P_j^n(y)\hat{\vartheta}(y)$$
$$\le P_j^n(y)\vartheta(y) \times P_{j+1}^n(x)\hat{\vartheta}(x), \ \forall\ x < y, \text{ and}$$

$$\text{(A14)}\qquad P_{j+1}^n(x)\vartheta(x) \times P_j^n(y)\hat{\vartheta}(y)$$
$$\le P_j^n(x)\vartheta(x) \times P_{j+1}^n(y)\hat{\vartheta}(y), \ \forall\ x > y.$$

Equation A14 simplifies to $P_{j+1}^n(x)P_j^n(y) \le P_j^n(x)P_{j+1}^n(y)$, which holds when $x > y$. Rewriting Equation A13, we can obtain Equation A11. If Equation A11 holds in strict inequality, so does Equation A12, suggesting that $\hat{s}$ is strictly less steep than s.

Proof of P_5

P_{5a}. We offer proof by contradiction. Suppose that we have m plateaus. Let $\hat{s}$ denote the new optimal share structure after increasing the total resources. Note that $\overline{\alpha}_j$'s remain the same. We assume that $\hat{z}_l \le z_l$ for some $l \in \{1, 2, \ldots, k^*\}$. Then, it must be that $\hat{z}_k \le z_k$ for all $k \in \{1, 2, \ldots, m\}$. Otherwise, we assume that $\hat{z}_j > z_j \ge 0$ for some $j \in \{1, 2, \ldots, m\}$. Because $\hat{z}_j > 0$ and $z_l > 0$, in line with the first-order condition (Equation 14), $\overline{\alpha}_j Q'(\hat{z}_j) \ge \overline{\alpha}_l Q'(\hat{z}_l)$ and $\overline{\alpha}_l Q'(z_l) \ge \overline{\alpha}_j Q'(z_j)$. Because $\overline{\alpha}_l Q'(\hat{z}_l) \ge \overline{\alpha}_l Q'(z_l)$, we have $\overline{\alpha}_j Q'(\hat{z}_j) \ge \overline{\alpha}_j Q'(z_j)$, which contradicts with $\hat{z}_j > z_j$. However, if $\hat{z}_k \le z_k$ for all k, the available resources are not fully allocated, which cannot be optimal. Thus, all shares with positive sizes must increase with the total resources. As a result, the number of positive shares weakly increases.

P_{5b}. Let s and $\hat{s}$ denote the share structure before and after increasing the total resources, respectively. Consider $z_{k+1} > 0$ (so that $\hat{z}_{k+1} > 0$). In accordance with the optimal condition in Equation 14,

$$\frac{Q'(z_k)}{Q'(z_{k+1})} = \frac{\overline{\alpha}_{k+1}}{\overline{\alpha}_k} = \frac{Q'(\hat{z}_k)}{Q'(\hat{z}_{k+1})}.$$

Noting that

$$\int_a^b \frac{Q''(x)}{Q'(x)}dx = \ln\frac{Q'(b)}{Q'(a)},$$

we have the following:

$$\text{(A15)}\qquad \int_{z_{k+1}}^{z_k} \frac{Q''(x)}{Q'(x)}dx = \int_{\hat{z}_{k+1}}^{\hat{z}_k} \frac{Q''(x)}{Q'(x)}dx.$$

We also denote the advertisers' price elasticity of demand as follows:

$$r(x) \equiv -\frac{Q'(x)}{Q''(x)x}.$$

Note that

$$\text{(A16)}\quad \int_a^b \frac{Q''(x)}{Q'(x)}dx = -\int_a^b \frac{1}{r(x)x}dx = -\frac{1}{r(\xi)}\int_a^b \frac{1}{x}dx = -\frac{1}{r(\xi)}\ln\frac{b}{a},$$
$$\text{for some } \xi \in (a, b).$$

From our previous discussion, we know that $z_{k+1} < \hat{z}_{k+1}$ and $z_k < \hat{z}_k$. Suppose that $z_k \le \hat{z}_{k+1}$. Substituting Equation A16 into both sides of Equation A15, we get the following:

$$\frac{1}{r(\xi)}\ln\frac{z_k}{z_{k+1}} = \frac{1}{r(\hat{\xi})}\ln\frac{\hat{z}_k}{\hat{z}_{k+1}},$$
$$\text{where } z_{k+1} < \xi < z_k \le \hat{z}_{k+1} < \hat{\xi} < \hat{z}_k.$$

Then, it is straightforward that $r'(\cdot) > (<, =)\ 0$ implies the following:

$$\frac{z_k}{z_{k+1}} < (>,\ =)\frac{\hat{z}_k}{\hat{z}_{k+1}} \text{ or } \frac{\hat{z}_{k+1}}{z_{k+1}} < (>,\ =)\frac{\hat{z}_k}{z_k}.$$

If $\hat{z}_{k+1} < z_k$, we can rewrite Equation A15 as follows:

$$\int_{z_k}^{\hat{z}_k} \frac{Q''(x)}{Q'(x)}dx = \int_{z_{k+1}}^{\hat{z}_{k+1}} \frac{Q''(x)}{Q'(x)}dx.$$

By the same logic, $r'(\cdot) > (<, =)\ 0$ implies the following:

$$\frac{\hat{z}_{k+1}}{z_{k+1}} < (>,\ =)\frac{\hat{z}_k}{z_k}.$$

Proof of P_6

We begin by deriving v_0^*. The first-order derivative of the expected revenue (Equation 18) with respect to the marginal type (v_0) is $-n\Sigma_{j=1}^n Q(s_j)P_j(v_0)J(v_0)f(v_0)$. The optimal marginal type is either an interior solution of $J(v) = 0$ or one of the two corner solutions ($\underline{v}$ or $\overline{v}$). Note that $\overline{v}$ cannot be optimal, because the expected revenue decreases in the neighborhood of $v = \overline{v}$ (implied by $J(\overline{v}) > 0$). Under the MHR condition, v_0^* is either the solution to $J(v_0) = 0$ or $\underline{v}$, whichever is higher.

We prove P_6 for any $v_0 \in (\underline{v}, v_0^*]$. We denote $h_j(v) \equiv nP_j(v)f(v)$. Note that $\alpha_j(v_0) = \alpha_j(v) - \int_{\underline{v}}^{v_0} h_j(v)J(v)dv$. According to Lemma 3, a sufficient condition is that for any j such that $s_{j+1}^* > 0$ (where s_{j+1}^* denotes the (j + 1)th share in the optimal share structure under no minimum bid),

$$\text{(A17)} \quad \frac{\alpha_{j+1}(v_0)}{\alpha_j(v_0)} = \frac{\alpha_{j+1}(\underline{v}) - \int_{\underline{v}}^{v_0} h_{j+1}(v)J(v)dv}{\alpha_j(\underline{v}) - \int_{\underline{v}}^{v_0} h_j(v)J(v)dv} > \frac{\alpha_{j+1}(\underline{v})}{\alpha_j(\underline{v})}.$$

Following steps in the proof of Lemma 1b (see http://www.marketingpower.com/jmjuly09), we can similarly show that $\int_{\underline{v}}^{v_0} h_j(v)dv < \int_{\underline{v}}^{v_0} h_{j+1}(v)dv$ and $h_j(v)/\int_{\underline{v}}^{v_0} h_j(v)dv$ first-order stochastically dominates $h_{j+1}(v)/\int_{\underline{v}}^{v_0} h_{j+1}(v)dv$. Thus:

$$\text{(A18)} \quad \frac{\int_{\underline{v}}^{v_0} h_j(v)J(v)dv}{\int_{\underline{v}}^{v_0} h_j(v)dv} > \frac{\int_{\underline{v}}^{v_0} h_{j+1}(v)J(v)dv}{\int_{\underline{v}}^{v_0} h_{j+1}(v)dv}.$$

In accordance with the MHR condition, $J(v) \le 0$ for $v \le v_0^*$, so we have the following:

$$\text{(A19)} \quad 0 > \int_{\underline{v}}^{v_0} h_j(v)J(v)dv > \frac{\int_{\underline{v}}^{v_0} h_j(v)dv}{\int_{\underline{v}}^{v_0} h_{j+1}(v)dv} \int_{\underline{v}}^{v_0} h_{j+1}(v)J(v)dv,$$

$$> \int_{\underline{v}}^{v_0} h_{j+1}(v)J(v)dv,$$

where the last inequality is due to $0 < \int_{\underline{v}}^{v_0} h_j(v)dv < \int_{\underline{v}}^{v_0} h_{j+1}(v)dv$.

Given $s_{j+1}^* > 0$, we have $\alpha_{j+1}(\underline{v}) > 0$. The result (Equation A17) follows from the notion that $\alpha_j(\underline{v}) > \alpha_{j+1}(\underline{v}) > 0$ (Lemma 1) and that $0 > \int_{\underline{v}}^{v_0} h_j(v)J(v)dv > \int_{\underline{v}}^{v_0} h_{j+1}(v)J(v)dv$ (Equation A19).

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Erratum

The article "Understanding the Marketing Department's Influence Within the Firm," which was published in the March 2009 issue of *Journal of Marketing*, provides a typical definition of market orientation on page 19. The definition borrows heavily from Slater and Narver (1995), and this erratum serves to acknowledge their contribution to the definition.

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Slater, Stanley F. and John C. Narver (1995), "Market Orientation and the Learning Organization," *Journal of Marketing*, 59 (July), 63–74.

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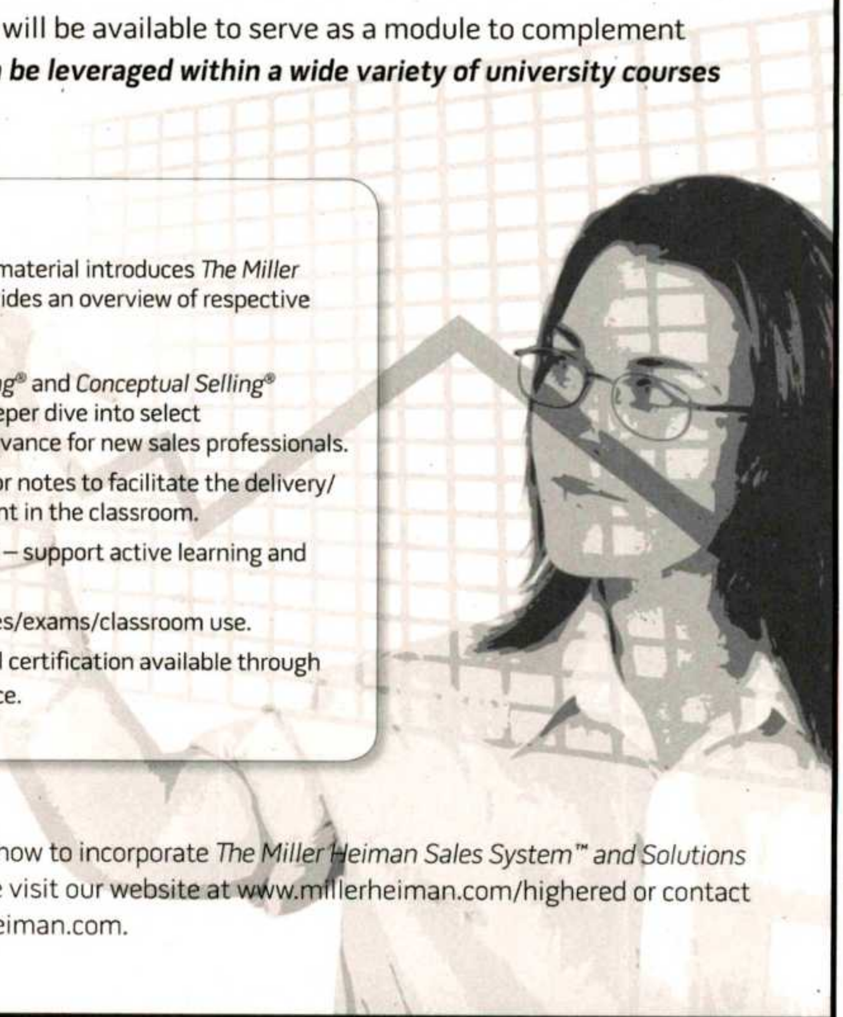

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